行政院第十三次科技顧問會議

議題貳

國際科技合作的加強

主題（四）：

先導性國際中文資訊網路系統

1. 開放式系統互連(OSI)之標準技術與網接技術
2. 統一化之中文資訊環境與中文化資料庫

〔更新版〕

STAG-ROC

時　　間：中華民國八十一年六月廿二日至廿七日
地　　點：交通部民用航空局國際會議廳
（台北市敦化北路340號）
主辦單位：行政院科技顧問組

先導性國際中文資訊網路系統

主辦單位：交通部電信總局
協辦單位：資訊工業策進會

中華民國八十一年六月二十四日

內　　容

Executive Summary

With our economics at a historical high, our country is striving to become an Asian high technology center as well as an international financial center. We are playing an especially important role in preserving and developing Chinese culture. To add on our muscles in influencing the international community and to well-perform our historical and cultural duties, it is technically worthwhile to consider a pilot International Chinese Information Network system.

In addition to typical services, the International Chinese Information Network system will also provide a variety of ROC-relevant multi-lingual informations, such as culture assets, travellers' guide, academic research, economy, finance, education, and domestic infrastructures, etc. On the one hand, it will promote domestic development of distributed database and computer networking. On the other hand, it will provide overseas Chinese with informational and educational services, and expedite the output of Chinese information and culture to the international community. In the long run, the Chinese Information Network system could be a pioneer of the ROC Information Network System and an emblem of our culture achievement and national strength.

To serve those purposes, the following actions should be arranged and executed by the proper authorities at a fast pace:

1. Promote the unification and the standardization of the international Chinese interchange code and communication protocols to achieve

smooth connectivity among international Chinese information networks.

2. Build a pilot International Chinese Information Network system to establish a multilingual database offering information about our culture, academic research, education, economy, tourism, foreign trade, patents and finance, etc. so that we can accelerate the circulation of domestic information, provide information services to overseas Chinese, maintain a balance among different cultures and, hopefully, it would have some potential and substantial influence on mainland China in the near future.

In the following sections, two important and correlated subtopics: (1) technology for OSI standard and networking (2) unified Chinese information environment and Chinese database will be elaborated upon further respectively, involving background and analysis, ideas and assessment, proposed solutions and expected results, and the implementation of the proposed solutions. The two subtopics are closely related and mutually influential, that is, the fulfillment of the latter depends heavily on the powerful support from the former.

摘要

我國經濟繁榮，未來將努力成爲亞洲科技重鎮及金融中心。我們在中華文化之傳承和成長上也扮演特殊且重要的地位。如何在世界舞台上增加影響力、在歷史文化中善盡職責，從技術層面看，建立先導性國際中文資訊網路系統是一值得考慮的計畫。

此一中文資訊網路系統除提供一般的服務外，將特別考慮與我國有關之文化、觀光、學術、經濟、金融、教育、建設等多樣化而又多語言資訊，對內可促進分散式資料庫與電腦網路之發展，對外可提供海外僑胞資訊與教育之服務，並加強對外之資訊與文化之輸出。此一中文資訊網路長期而言，可能成爲我國代表性之資訊網路系統，象徵國力與文化之水準。

爲使此一中文資訊網路能夠暢通無阻，有需要推動通信協定與中文資訊之標準化。因此在通盤構想中，擬由有關單位負責開放式系統互連（OSI）通信協定技術標準之擬訂與符合性之測試、萬國碼（UNICODE）之推動、中文電腦技術發展之整合，冀經此一產官學研之結合與各科技領域與文化之匯流，促進我國中文資訊技術再進一步發展，文化資訊藉著科技之助再進一步成長遠播。

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基於上述因素，國內有關單位宜加速規劃與推動下列工作：

1. 協助推動國際中文交換碼之統一與通信協定之標準化，以促成國際中文資訊網路之暢通。

2. 建設先導性國際中文資訊網路系統，以整合多樣化、多語言的我國資料庫，包括文化、學術、教學、觀光、外貿、專利、金融等，對內促進資訊流通應用，對外提供海外僑胞資訊服務、平衡國際文化交流，並預期未來對大陸有潛移默化之效果。

以下就其中兩項相互關連之重要子題（1）開放式系統互連(OSI)通信協定技術標準與網接技術（2）統一化之中文資訊環境與中文化資料庫，分別詳細說明其問題背景、解決構想、建議方案及執行規劃。兩者相輔相成、息息相關，亦即要完成後者需要借助前者強有力的支持。

一、前言

我國經濟多年來之發展活力充沛，因此國內外資訊流通也開始多采多姿。除傳統資訊形式外，經由通信網路之交流也有相當進步，惟各成一系。其中加值網路服務所提供資訊檢索、查詢、處理、遠端交易、電子郵件等，民間公司與電信局都在經營這些業務（如表一）。最近研考會與資策會進行行政機關與民間電子資料庫檔案供需之調查，將於七月公佈。初步瞭解約可開放一千多個資料庫，分成三等級：即供政府機關、供學術研究與供一般大眾使用等，資訊內容包括金融、經濟統計、商情、產業、科技、專利商標、生活休閒、新聞、學術等。

我政府機關在資訊應用之加強近年不遺餘力，在八十一年四月已由交通部主辦、研考會和主計處協辦共同擬訂「政府機關行政資訊網路計畫建議書」，預定提供政府機關間以及與民眾間三類服務：網路應用、公眾資訊服務與爲民服務。

上述各項政府與民間共同的努力，已使資訊網路可通海內外，服務廣達政府、企業與個人。惟時勢推移，我國所要扮演的角色與在全球所要發揮的影響力，未來必定與日俱增。目前我國對國外資訊的需求大於國外對我們的需求，如何增加我國資訊與文化的輸出，以強化我國在世界上的地位以及對海外僑胞的服務，是現階段就該考量的。所可採行的措施中，籌劃先導性國際中文資訊網路系統是結合文化與科技，實具有相當大的意義。

二、開放系統互連（OSI）之標準技術與網接技術

1. 問題背景與問題分析

－不同廠牌的電腦不易互通資訊，中文資訊化社會無法早日到來；

－針對基本標準若干備選項目及參數需加以設定，以反應地區性之需求；

－OSI應用層之通信協定標準有許多種，隨科技之演進而推陳出新，必須同步掌握最新技術標準之資料；

－電腦通信網路之技術標準尚無國家級的單位來擬定及推廣。

2. 解決構想及其評估

－標準規範的研擬必須以更爲開放的作法，集合產官學研各機構及專家學者共同參與；

－仿照美國IEEE組織，在中國電機工程學會內，擬定通訊協定標準規範並進行推廣工作；

－標準規範的研擬必須同時進行推廣工作，否則等於零；

－必須持續性地派員參加OSI有關之國際會議，以獲取最新之電腦通信網路之技術標準。

評估：標準的研擬工作更爲開放，推廣工作可以更爲落實。

3. 建議方案及預期效果

－在中國電機工程學會標準委員會下設OSI分組委員會，研擬及推廣OSI通信協定標準規範，使成爲國家級的電腦通信網路標準規範之研擬及推廣之機構；

－OSI分組委員會由電信總局、工研院、資策會及金融資訊中心爲基本團體會員，中央標準局及亞太科技協會等爲贊助團體會員，另有一般團體會員及個人會員，網羅資訊及通信業界及專家學者，使標準規範的研擬工作能更爲開放，推廣工作更爲開展；

－積極爭取各大學電腦通信方面之專家學者，參加爲個人會員，以網羅國內電腦通信方面的專家學者，從事標準之研擬工作；

－由電信總局電信研究所在南港軟體工業園區建立符合性測試中心及互運測試中心，透過光纖網路測試廠商發展完成之通信軟體產品，使我國通信軟體可以按標準的規範來發展，並可帶動軟體的外銷；

－由經濟部中央標準局編列預算，支援標準研擬及推廣之工作，並公佈爲國家標準，可以使各機構的電腦或資料庫能按國家標準來設計及銜接；

－定期舉辦研討會及產品展示會，以宣揚電腦通信之標準規範；

－積極參與OSI有關之國際會議，以獲取此方面最新之技術標準之資料；

－積極爭取承辦OSI有關之國際會議並推薦國內專家擔任國際會議分組主席，以提高我國之國際地位；

－定期舉辦OSI全體大會，以較開放性之作法研討標準規範之草案；

4. 建議方案之執行規劃

<1> 中國電機工程學會設置OSI分組委員會之組織架構及其專門小組名稱（如圖一及二）

<2> OSI符合性測試中心之組織規劃（如圖三）

－應用層測試服務之時程（如圖四）（策略圖如圖五）

－網路層測試服務之時程（如圖六）（策略圖如圖七）

<3> OSI符合性測試中心之經費需求（如圖八）

<4> COSInet維運中心之組織架構（如圖九）

<3>及<4>項建議設置於改組後之電信總局監理處內，成爲電腦通信網路之監理執行單位。

<5> 建議請經濟部中央標準局編列預算，以支援標準規範之研擬及推廣工作（如圖十）

三、統一化之中文資訊環境與中文化資料庫

1. 問題背景與問題分析

－中文碼目前萬碼奔騰，中文化資訊無法交流，有必要及早統一，才能建立一致性的中文資訊環境；

－中文電腦的技術發展各自獨立，進展緩慢，有必要進行世界性之技術交流，以整合各地域技術發展之環境；

－中華民國是中華文化的根，有必要將中華文化傳播至世界華人生活的地區；

－中華民國將成爲亞洲科技重鎮及金融中心，有必要將外貿、專利、金融等資訊向國外宣揚；

－中華民國也是觀光勝地，有必要向海外宣揚及報導；

－國外資料庫林立，使用者普遍透過電腦通信網路擷取所需之資訊，我國在這方面宜迎頭趕上；

－國內對國外資訊之使用量大於國外對國內資訊之使用量，有必要加強拓展中文資訊外銷；

－國內資料庫各自獨立運作，且偏重金融市場，有必要整體規劃，使包括文化、外貿、專利、觀光、新聞、...等。

2.解決構想及其評估

構想：

－採用兩岸及日、韓已有共識且已成爲國際標準之ISO 10646或UNICODE萬國碼爲中文環境之標準交換碼，不同編碼系統應以其爲國際交換碼；

－在國內外舉辦中文電腦技術發展研討會，以融合國內外及海峽兩岸 中文電腦各方面之發展技術；

－在國內建立分散式中文化資料庫系統，透過OSI電腦通信網路系統，連線至國外進出中心(Access Center)，以便全世界 的 華人能夠很方便地取用所需之中文資訊；

－國外進出中心與國內網路透過國際分封網路連接，使國外使用 者可以廉宜的享受到國內的文化資源；

－國內之中文化資料庫可包括：

中央圖書館的中文書典藏

中央標準局的專利與商標資訊

外貿協會的外銷商品資訊

時報資訊新聞

中央銀行的外匯資訊

觀光局的國內觀光及旅遊資訊

中央氣象局的氣象資料

中文化電腦輔助教學

證券公司的股市行情

等等

評估：

－將全世界的華人透過電信網路的連接，有如「天涯若毗鄰」的感覺，更增加一份對祖國的向心力；

－這是政府加強對海外華人的關心及照應，華僑在適當時期定能有所回饋祖國；

－舉辦中文電腦技術發展研討會可以累積經驗與成果，解決中文輸出入瓶頸、整合文字集與編碼、及統一開放式系統之環境，使中文資訊可以暢通無阻；

－長遠性如能與大陸地區文化交流是政府促進兩岸交流的開放性做法，可促進兩岸及早統一。

3.建議方案及預期效果

方案：

－由電信總局設立專案計劃，編列預算建立所需之網路，並協調各有關單位編列各自的預算，建立國內分散式中文化之資料庫以及標準化的通信介面，此一介面

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採用OSI 網路技術標準 ，可與國外主要電腦網路連接；

－由電信總局協調國外有關機構成立進出中心(Access Center)，連接至國內網路及各中文資料庫；

－電信總局擬定網路使用獎勵措施，並舉辦推廣活動；

－由資策會及台北市電腦公會洽電腦廠商依UNICODE之規格發展所需之中文化之工作站；

－由資策會洽同有關機關調查駐外單位及海外華僑關於資料庫之需求及市場；

－由中國電機工程學會聯合國內有關單位主辦中文電腦技術發展研討會，廣邀國內外及大陸專家學 者參加；

－建議文建會、陸委會、僑委會 編列預算，支援上述各機構之建設工作及研討會。有文化價值者由政府有關機關編定預算補助；有商業價值者可開放民間經營資料庫。

效果：

－國外使用者可以像本地一樣，擷取所需之中文資訊。

－向世界宣揚傳統固有文化的精華，包括中文圖書典藏、專利、外貿、新聞及中文化電腦輔助教學等資訊。

－利用中文化網路系統的建立，促進 國際性及 兩岸 的交流與合作。

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— 中文電腦各方面之技術發展，可集國內外之大成，向前躍進，使中文電腦之應用門户大開。

4.建議方案之執行規劃

(1)分別於台北及美國之華盛頓、洛杉磯、紐約設置四個網路進出中心(Access Center)，除可當作網路節點之通信伺服器(Communication Server)外，也兼作應用系統之應用伺服器(Application Server)，並於台北網路進出中心設置後端關聯式資料庫伺服器 (Back-End Relational Database Server)。網路架構示意圖如圖十一、短期系統架構圖如圖十二、長期系統架構圖如圖十三。

(2)先導性國際中文資訊網路之建設時程（如圖十四）。

(3)先導性國際中文資訊網路之經費需求（如圖十五）。

(4)中文電腦技術發展國際研討會研討項目表（如圖十六）。

研討會每年輪流在國內、國外輪流舉辦，配合研討會並舉辦成果展示會。舉辦此項研討會及赴國外參加研討會之旅費擬請文建會專案計劃專款補助。

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四、結語：

建立「先導性國際中文資訊網路系統」是我國文化與形象的表徵，是國際間的「中文資訊高速公路」，也是我中華文化輸出海外的孔道，以此網路之建設來帶動資訊與通訊標準的施行，使中文化的資訊可以四通八達，無遠弗屆。同時，這也是中華文化與電腦通訊技術的結合，把中華(Chinese)、文化(Culture)、電腦(Computer)及通訊(Communication)相互結合(C&C&C&C)成爲「龍的傳人團結之網」（簡稱龍網）(Dragonet)將它的觸鬚伸展到全世界每一個角落。

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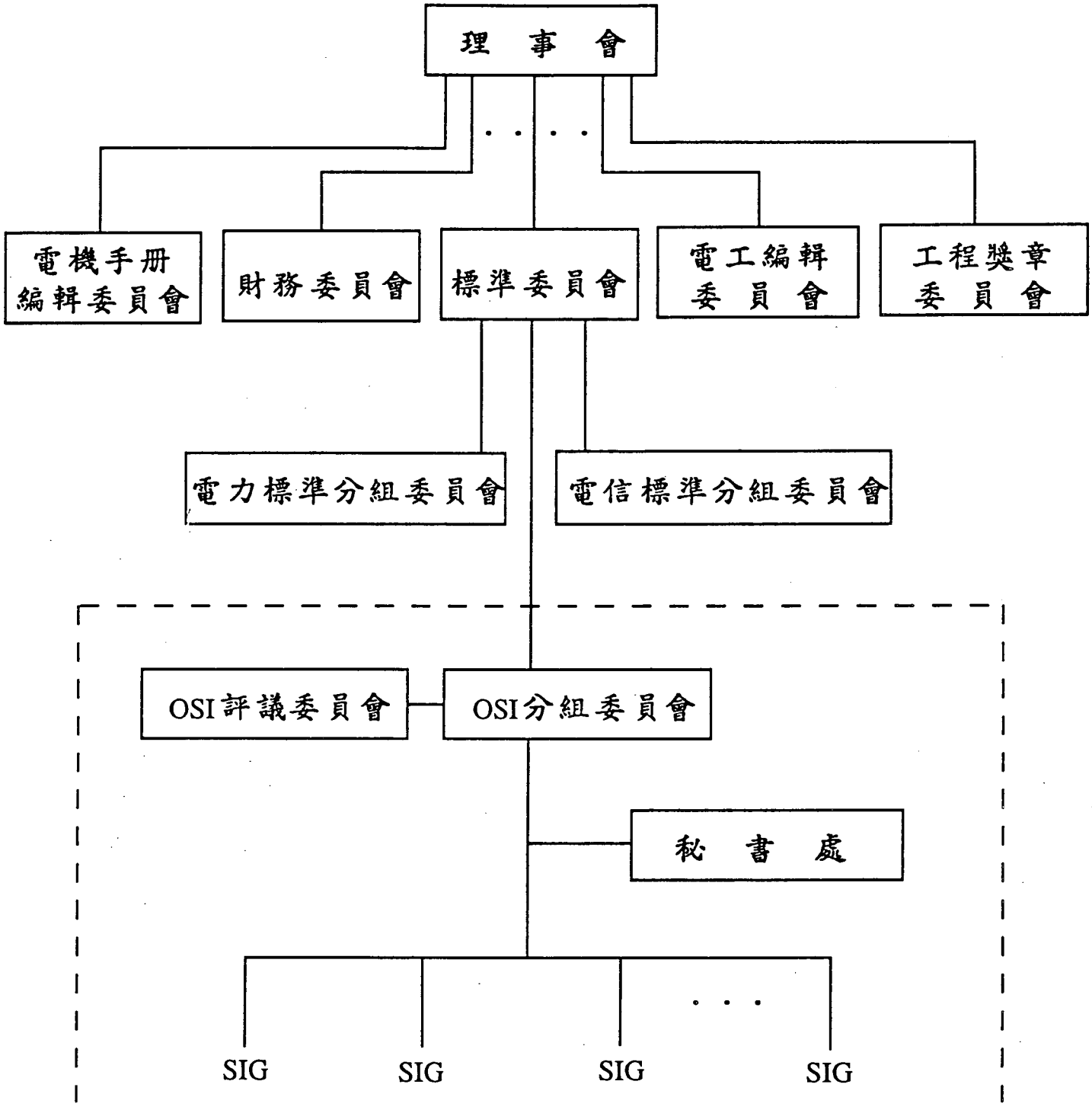


(1) 擬從民國81年7月1日起實施。

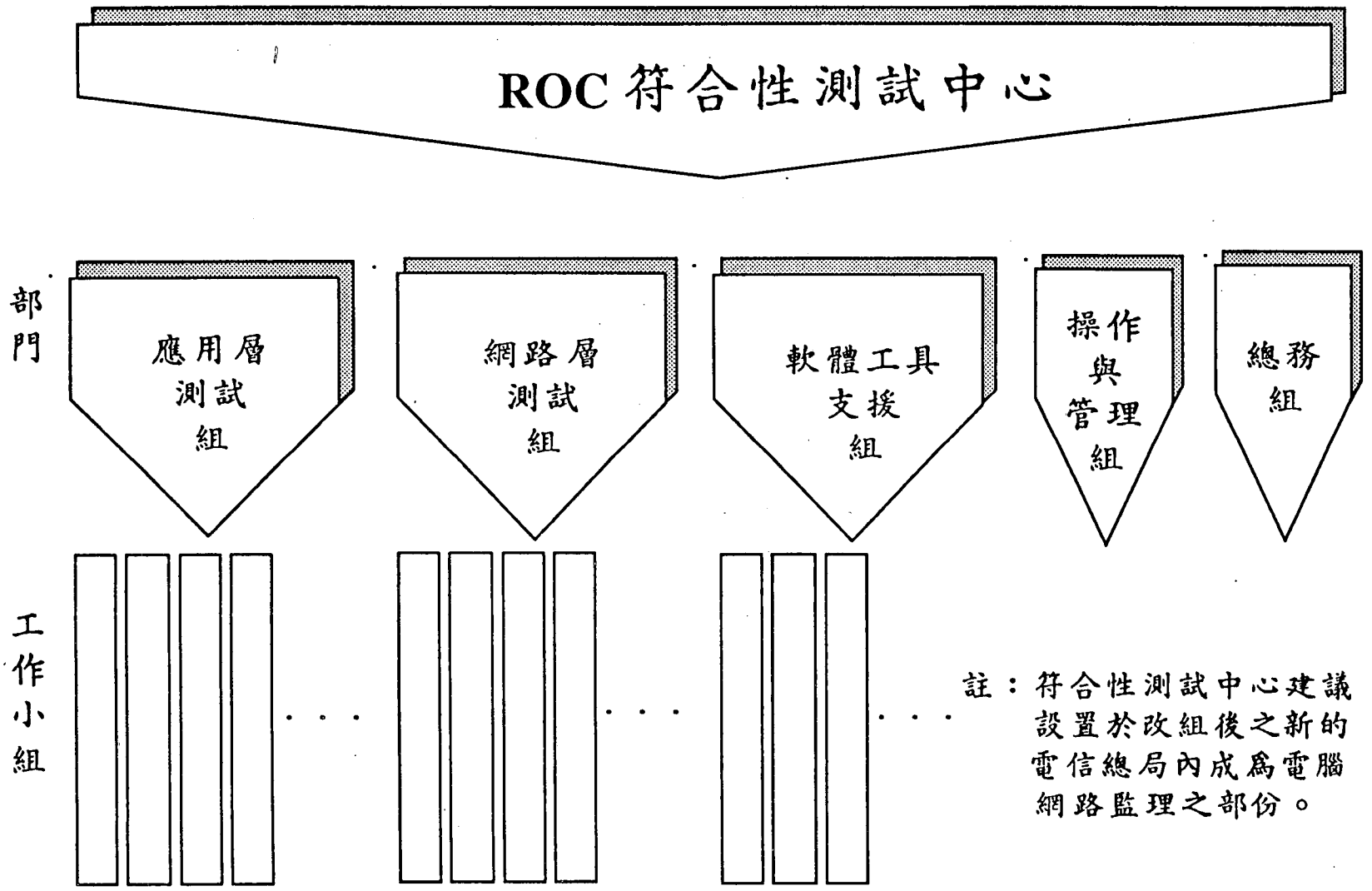
(2) 各SIG（專門分組）擬比照AOW設置14個，並增設3個國內特殊專門分組，各專門分組名稱見圖三。

圖一、中國電機工程學會OSI分組委員會組織架構

1. FTAM (File Transfer, Access and Management)
2. MHS (Message Handling System)
3. NM (Network Management)
4. DIR (Directory Service)
5. VT (Virtual Terminal)
6. TP (Transaction Processing)
7. ODA (Office Document Architecture)
8. EDI (Electronic Data Interchange)
9. LAN (Local Area Network)
10. WAN (Wide Area Network)
11. CUL (Common Upper Layer)
12. MMS (Manufacturing Messaging System)
13. DFR (Document Filing Retrieval)
14. PTS (Profile Test Specification)
15. Network Security
16. N&A (Naming and Addressing)
17. Interoperability

註：1. 1～14項係AOW現有之專門小組，15～17係國內特殊專門小組。
2. 第8項擬合併至第2項之MHS。
3. 第9、10項擬合併爲LL (Lower Layer) 下層協定。

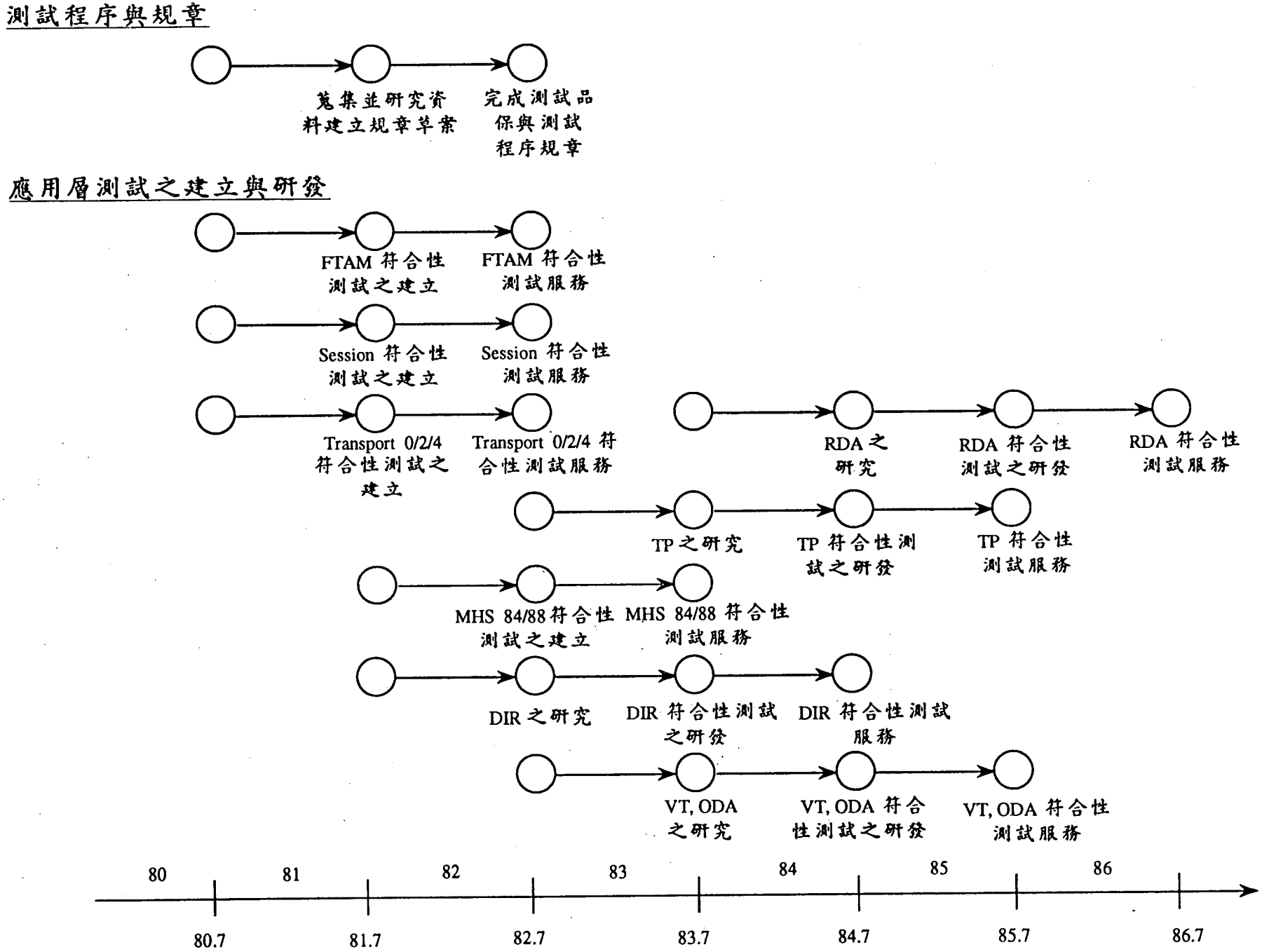
圖二、專門小組一覽表



圖三　ROC符合性測試中心之組織規劃

項目 / 年度	測試服務項目
82	檔案轉送、存取和管理協定（File Transfer、Access and Management protocol：FTAM） 交談層協定（Session protocol） 運送層協定（Transport class 0/2/3/4 protocol）
83	訊息處理服務協定（Message Handling Service protocol：MHS）
84	目標服務協定（Directory Service protocol：DS）
85	虛擬終端機協定（Virtual Terminal protocol：VT） 辦公室文件架構協定（Office Document Architecture protocol：ODA） 交易處理協定（Transaction Processing protocol：TP）
86	遠地資料庫存取協定（Remote Database Access protocol：RDA） 網路管理協定（Network Management protocol：NM）

圖四、 應用層測試服務之時程

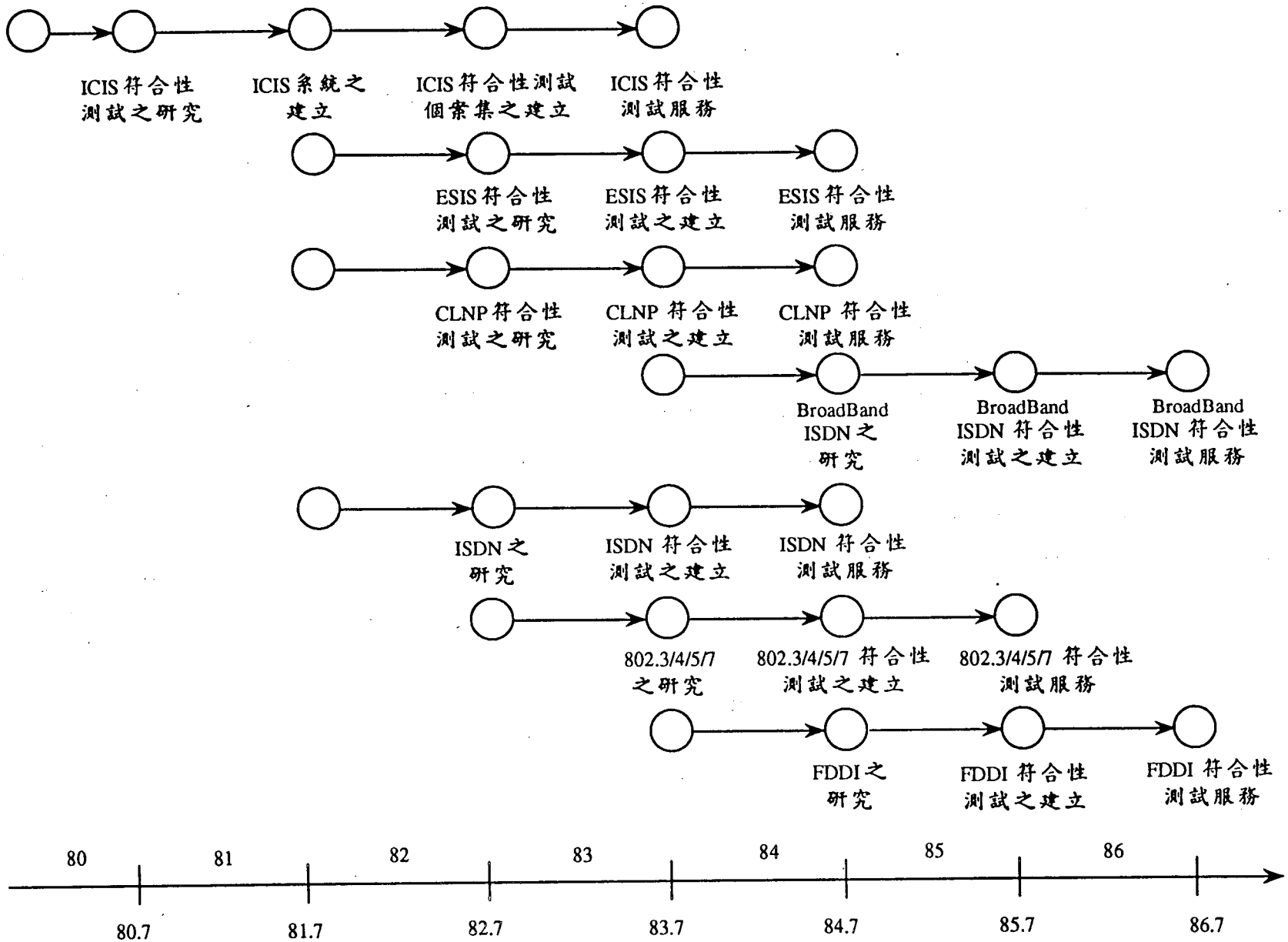


圖五 OSI協定符合性測試中心研究策略圖（一）

項目 / 年度	測試服務項目
83	中間系統至中間系統路由協定（Intermediate System to Intermediate System Routing protocol : IS-IS）
84	整合服務數位網路協定（Integrated Service Digital Network protocol : ISDN） 端末系統至中間系統路由協定（End System to Intermediate System Routing protocol : ES-IS） 免接式網路協定（ConnectionLess Network protocol : CL NP）
85	以太網路協定（Ethernet : 802.3） 標記匯流排網路協定（Token Bus : 802.4） 標記環網路協定（Token Ring :802.5） 分散式佇列雙向匯流排網路協定（Distributed Queue Dual Bus : DQDB）
86	寬頻整合服務數位網路協定（Broadband Integrated Service Network protocol : BISDN） 光纖分散式資料介面協定（Fiber Distributed Data Interface :FDDI）

圖六、 網路層測試服務之時程

網路層測試之建立與研發



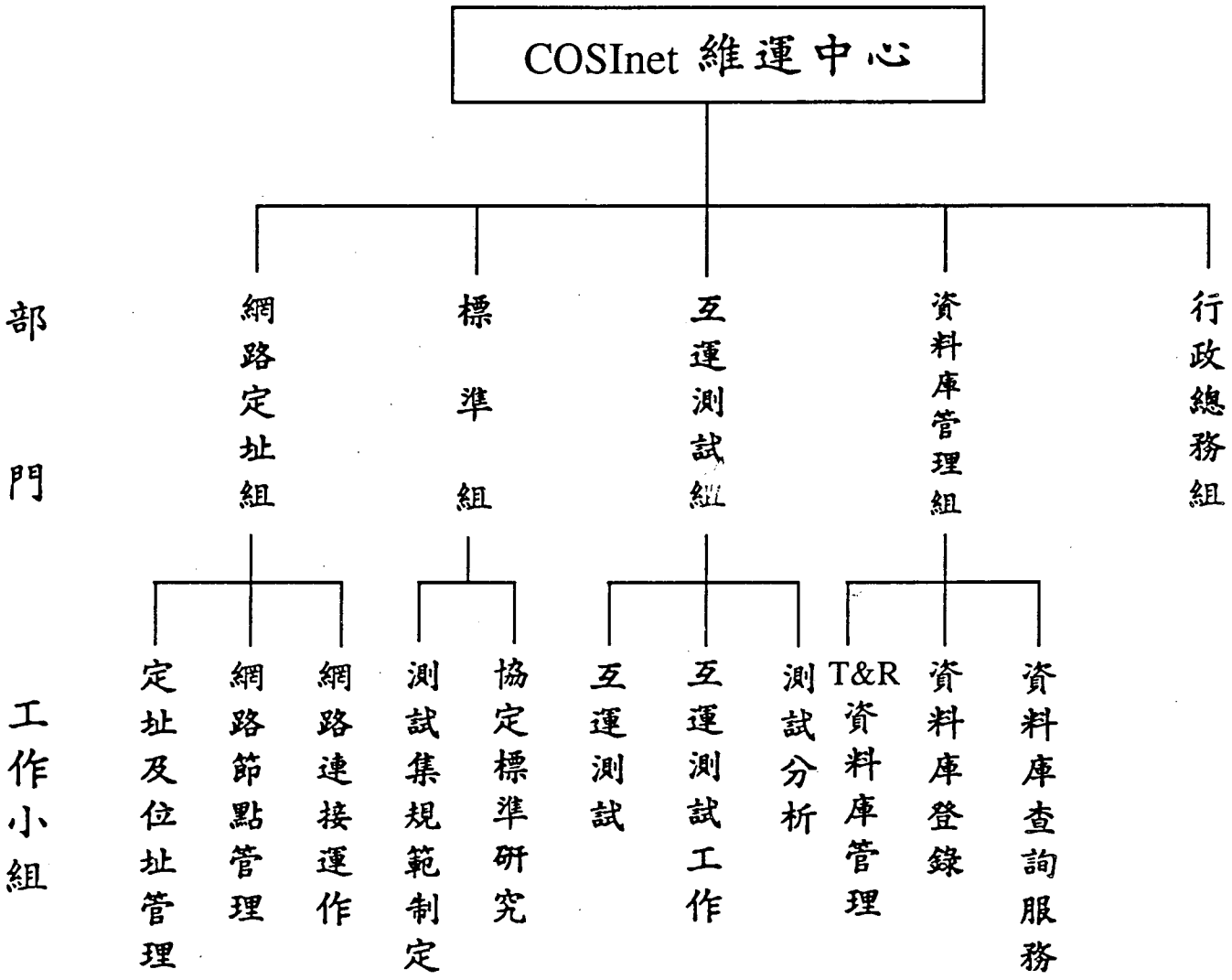
圖七　OSI協定符合性測試中心研究策略圖（二）

經費需求：　　單位：千元

年度 / 項目	81	82	83	84	85	86	81-86 合計
1. 資本設備費	14,500	25,000	17,000	17,000	11,000	11,000	95,500
2. 經常費	36,000	61,380	77,319	95,832	111,996	130,442	512,969

附註：
1. 人事費以平均每人5萬元〔15月〕計算，每年再以10%調薪。
2. 經常費＝人事費×120%〔以多出20%爲其它經常費用之預估〕。
3. 資本設備費於本機關年度原預算內支應。
4. 經常費儘可能於本機關年度預算內支應，不足之數擬申請科技專案支應。

圖八、　OSI 符合性測試中心經費需求



註：COSInet 維運中心建議設於電信總局內成爲監理之一部份。

圖九、互運測試中心COSInet組織架構

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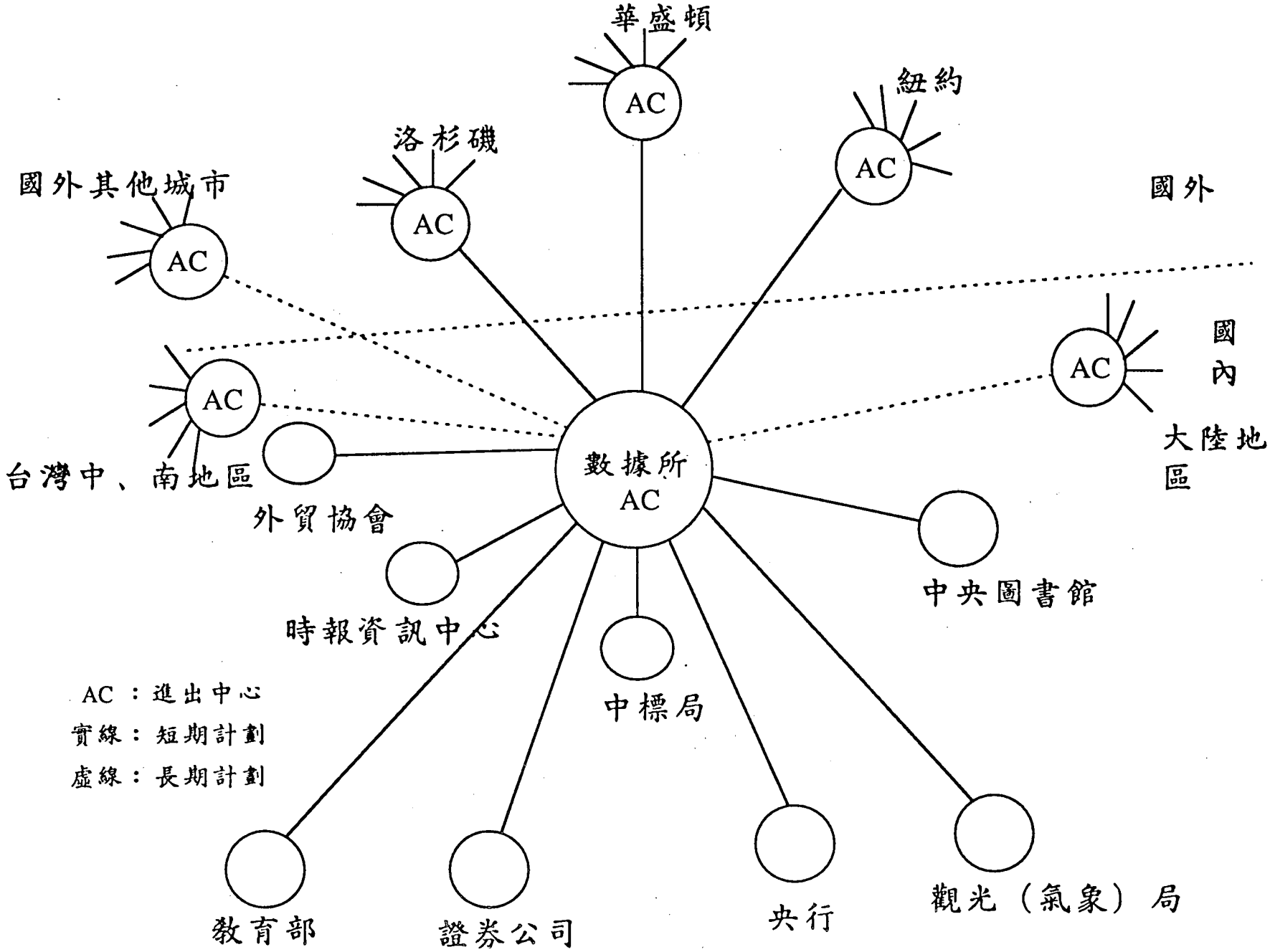
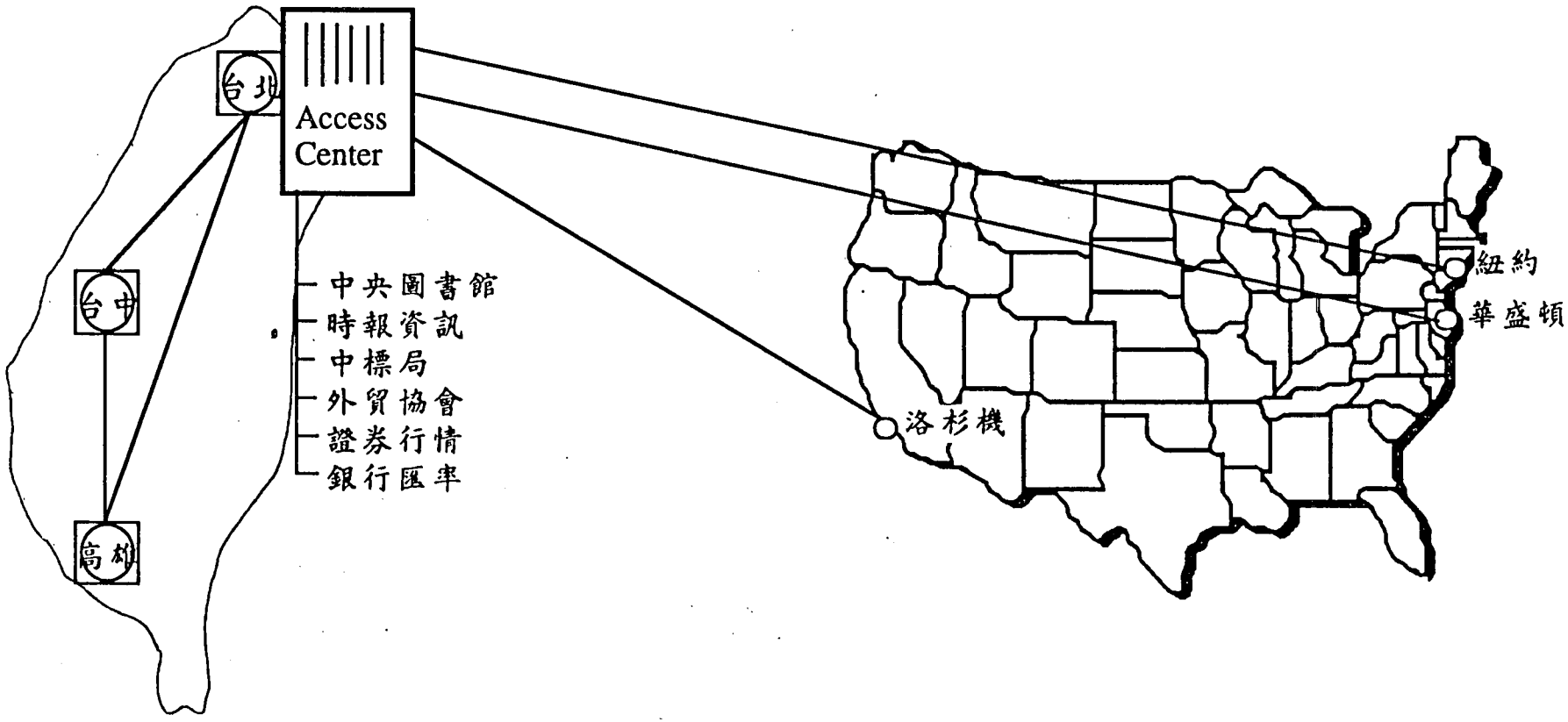
經費單位：新台幣千元

工作年度	八十二年度	八十三年度	八十四年度
所需經費	11,000	16,000	21,000
工作年度	八十五年度	八十六年度	八十七年度
所需經費	26,000	30,000	35,000

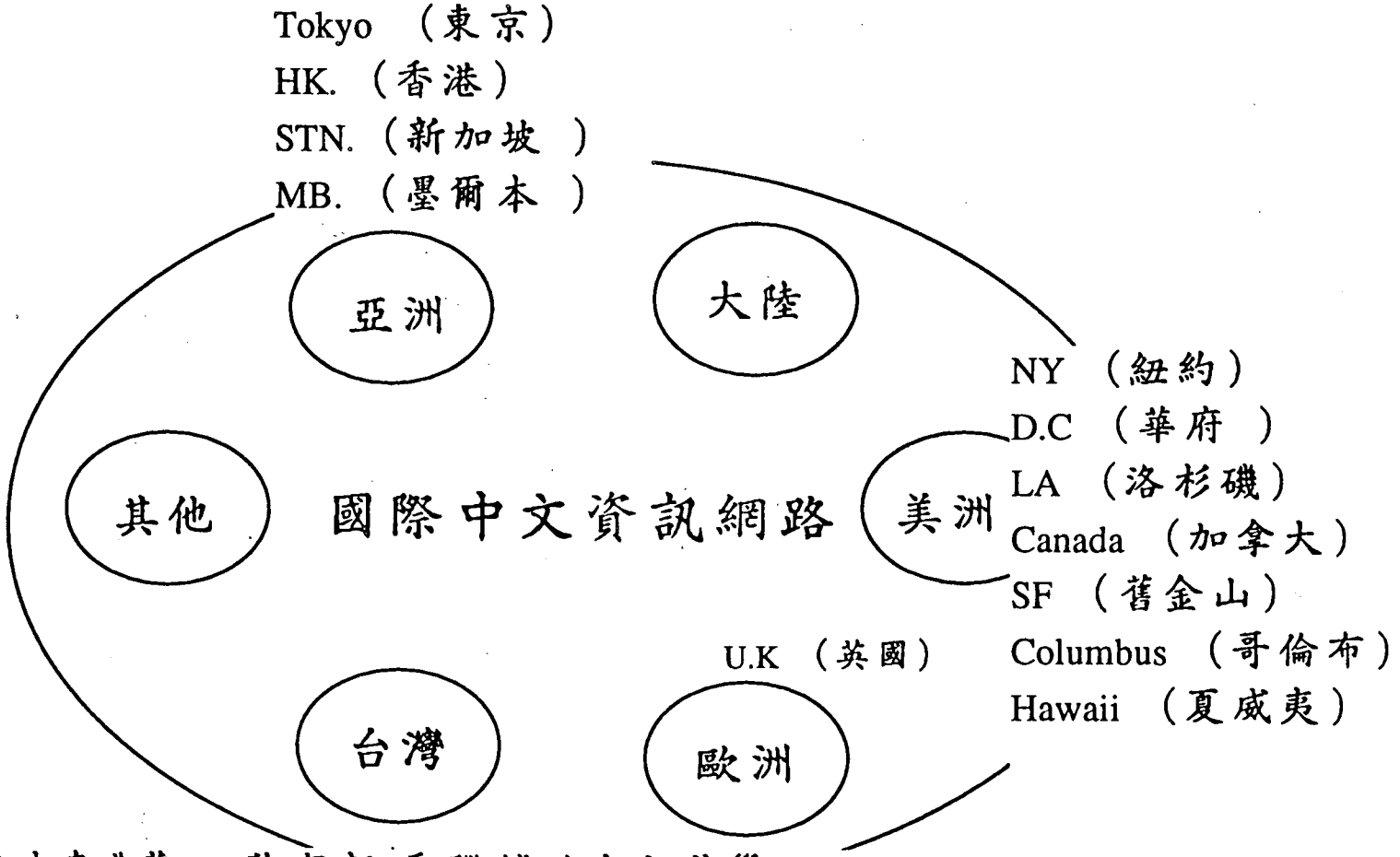
圖十、OSI通信協定標準化之研擬及推廣經費預算表


華盛頓
AC
紐約
AC
洛杉磯
AC
國外其他城市
AC
國外
AC
國內
大陸地區
AC
台灣中、南地區
外貿協會
數據所
AC
中央圖書館
時報資訊中心
中標局
AC：進出中心
實線：短期計劃
虛線：長期計劃
教育部
證券公司
央行
觀光（氣象）局

圖十一、網路架構示意圖


台北
台中
高雄
Access
Center
中央圖書館
時報資訊
中標局
外貿協會
證券行情
銀行匯率
洛杉磯
紐約
華盛頓

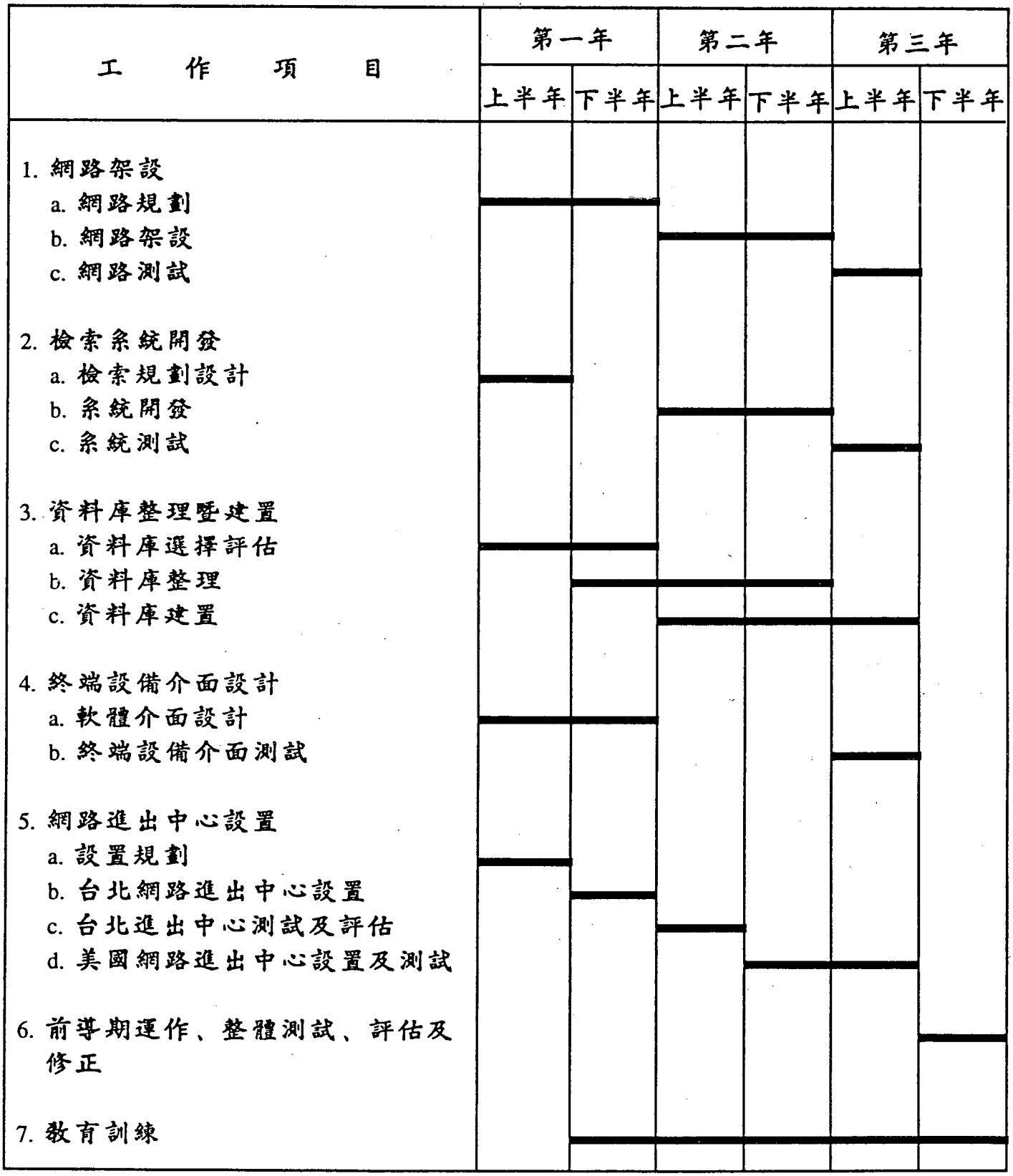
圖十二、短期資訊網路



資料庫：中央圖書館(中書典藏)
中央標準局(專利)
時報資訊(新聞)
外貿協會(外銷商品)

教育部(電腦輔助中文教學)
觀光、氣象局(觀光、氣象報導)
證券行(股市、期貨行情)
中央銀行(匯率)

圖十三、長期系統架構圖



圖十四、 網路與資料庫建設時程

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單位：千元

項　　目	第一年	第二年	第三年	合　計
1. 資本投資	66,000	96,000	46,000	208,000
2. 軟體外包	50,000	70,000	30,000	150,000
3. 經常費	20,000	30,000	40,000	90,000
總　　計	136,000	196,000	116,000	448,000

圖十五、先導性國際中文資訊網路之經費需求

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一、輸入法：

1. 傳統之鍵盤輸入法
2. 掃描器輸入法（字形辨認技術）
3. 手寫輸入法（字形辨認技術）
4. 語音輸入法（語音辨認技術）

二、輸出法：

1. 字形產生技術
2. 字形標準
3. 中文排版技術
4. 語音合成技術
5. 中文顯示技術

三、字集與編碼

1. 各國文字集與編碼
2. ISO 10646與UNICODE
3. 如何統合至ISO 10646或UNICODE

四、開放式中文環境

1. 程式語言
2. 資料庫進出法
3. 通訊軟體
4. 作業系統
5. 視窗

圖十六、中文電腦技術發展研討會研討項目表

網路資訊系統 / 主要特性	BITNET	INTERNET	SEEDNET	STICNET	TANET
網路協定	NJE (IBM)	TCP/IP	TCP/IP	WSN	TCP/IP
中文內碼	IBM 碼	無	CNS 11643	WANG 碼	IBM 碼
系統架構	終端模擬	終端模擬	終端模擬 + 主從架構	終端模擬	終端模擬
自動轉接功能	無	無	無	無	無
中文資料庫整合	少	無	少	少	少
特色	連接全球大學及學術研究機構。	由最初美國國防部之通訊需求衍生成全球最大之網路系統。	提供國內資訊界發展軟體所需之資訊、方法、標準及工具，用以提升我國資訊軟體開發能力與生產力。	提供國內研究人員科技性資訊系統。	建立國內學術網路。

表一、 資訊網路現況調查

PILOT PROJECT

of

INTERNATIONAL CHINESE INFORMATION NETWORK SYSTEM

Directorate General of Telecommunication, MOTC

Institute for Information Industry

June 24, 1992

Table of Contents

Executive Summary

With our economics at a historical high, our country is striving to become an Asian high technology center as well as an international financial center. We are playing an especially important role in preserving and developing Chinese culture. To add on our muscles in influencing the international community and to well-perform our historical and cultural duties, it is technically worthwhile to consider a pilot International Chinese Information Network system.

In addition to typical services, the International Chinese Information Network system will also provide a variety of ROC-relevant multi-lingual informations, such as culture assets, travellers' guide, academic research, economy, finance, education, and domestic infrastructures, etc. On the one hand, it will promote domestic development of distributed database and computer networking. On the other hand, it will provide overseas Chinese with informational and educational services, and expedite the output of Chinese information and culture to the international community. In the long run, the Chinese Information Network system could be a pioneer of the ROC Information Network System and an emblem of our culture achievement and national strength.

To serve those purposes, the following actions should be arranged and executed by the proper authorities at a fast pace:

1. Promote the unification and the standardization of the international Chinese interchange code and communication protocols to achieve

smooth connectivity among international Chinese information networks.

2. Build a pilot International Chinese Information Network system to establish a multilingual database offering information about our culture, academic research, education, economy, tourism, foreign trade, patents and finance, etc. so that we can accelerate the circulation of domestic information, provide information services to overseas Chinese, maintain a balance among different cultures and, hopefully, it would have some potential and substantial influence on mainland China in the near future.

In the following sections, two important and correlated subtopics: (1) technology for OSI standard and networking (2) unified Chinese information environment and Chinese database will be elaborated upon further respectively, involving background and analysis, ideas and assessment, proposed solutions and expected results, and the implementation of the proposed solutions. The two subtopics are closely related and mutually influential, that is, the fulfillment of the latter depends heavily on the powerful support from the former.

1. Preface

With the energetic development in economics and culture in our country, all kinds of information interchange are rampant. Aside from traditional ways of media propagation, information transmitted by electronic or optical networks is also well grown. One of the services called Value Aided Network (VAN) service, which provides data retrieval, query, process, remote transaction and electronic mail, etc., can be provided by both private vendors and DGT. A survey newly conducted by Research, Development & Evaluation Commission and III on the supply and demand of electronic database in the administrative agencies and private companies is to be released in July. Some facts of the existing networks are shown in Table 1. The preliminary findings say that our country currently has more than one thousand databases in operation, which can be categorized into three domains: those used by government organizations, by academic institutes and by the general public. They include various information concerning databases for banking, economy statistics, business transactions, industrial and technological data, patent and trademark cases, recreation information, news, and academic materials, etc.

The government has long devoted to promoting the application of computers. In April 1992, a "Government Administration Information Network Proposal" has been worked out by MOTC, Research, Development & Evaluation Commission, and Directorate of Budget, Account & Statistics, intending to provide three kinds of services for

government organizations and the general public. They include network applications, information services and public services.

Thanks to the devotion of our government and people so that information network now reaches overseas and serving both the government and the private sectors. As time goes by, our historical roles and global influence will definitely be strengthened in the future. Currently, our information demands from abroad surpass those needed by them from us. So the way to increase our information and culture output to strengthen our position in the world and provide better services to overseas Chinese is something to which we should give some thought now. To design an advanced international Chinese information network, which has a definite bearing on culture and technology, is a very significant one.

2. Technology of OSI standards and networking

1. Background and Analysis

-Computers from different vendors have difficult exchanging information which delays the realization of a computerized Chinese information society;

-Some options and parameters in fundamental standards should be determined and agreed upon to accommodate local requirements;

-There are many standards in the application layer of the OSI model and the number is still growing with the emergence of new

technology. It is necessary to keep track and make use of the latest technology standards;

-There is still no national organization in charge of the drafting and promotion of technical standards in computer network.

2. Ideas and Assessment

-The drafting of standards should proceed in an open way, with the cooperation of industry sectors, government agencies, the academic society, R&D institutes, as well as the participation of individual experts and scholars.

-Chinese Institute of Electrical Engineering, following the example of U.S. IEEE, is a suitable organization for drafting of communication protocols standard profiles and in charge of promotion.

-Promotion of these standard profiles should be done simultaneously with the drafting process, otherwise all efforts would be in vain.

-Send delegates to international OSI meetings constantly to obtain newest standards on computer networking.

Assessment:

openness in drafting standard profiles and more effective promotion.

3. Proposed Solutions and Expected Results

-Set up an OSI subcommittee under the standard committee of Chinese Institute of Electrical Engineering to be in charge of the drafting and promotion of OSI communication protocol standards.

-Include DGT, ITRI, III, Financial Information System Center as basic group members in OSI subcommittee; National Bureau of Standards and Asia and Pacific Council for Science and Technology as sponsoring group members; information sectors, communication circle as general group members, and professionals and scholars as individual members, so that the establishment of standards could be more open and their promotion would be more effective.

-Set up Conformance Testing Center and Interoperability Testing Center by TL of DGT at Software Development Park in Nang-Kang to test the software products developed by private companies on an optical fiber network, so that all communication software will be manufactured in accordance with unified standards beneficial to our software export.

-Allocate budgets of National Bureau of Standards in Ministry of Economics for the study, drafting and promotion of the standards. Release the standards by NBS as soon as possible for the computer and databases of all agencies and institutes to follow, in design and internetworking, aiming for a nationwide all-Chinese distributed database.

-Hold seminars and product shows regularly to promote computer communication standards.

-Actively attend international meeting on OSI, to keep up with the latest and newest information in these areas.

-Compete to host international conference concerning OSI and recommend local experts to chair its Special Interest Group or Working Group , which could boost our national stand in the world tremendously.

-Hold OSI Plenary Meeting to discuss and decide on all the local requirements on standards in a more open manner.

4. The Implementation of Proposed Solution

-The organization of the OSI subgroup in the Chinese Institute of Electrical Engineering is shown in Figure 1 and Figure 2.

-The preliminary organization of the OSI Conformance Testing Center is shown in Figure 3.

•The schedule for Application Layer Testing Service is shown in Figure 4. Its strategy is shown in Figure 6.

•The schedule for Network Layer Testing Service is shown in Figure. 5. Its strategy is shown in Figure 7.

-The budget of OSI Conformance Testing Center is shown in Figure 8.

-The organization of COSInet Maintenance and Operation Center is shown in Figure 9.

We suggest that the OSI Conformance Testing Center and the COSInet Maintenance and Operation Center could be set up under the Supervisory & Administrative Department of the new DGT

after corporatization to be the supervisory authority for computer communication networks.

-Suggest that the National Bureau of Standards of the Ministry of Economic Affairs allocate budget to support the drafting and promotion of standards as shown in Figure 10.

3. Unified Chinese Information Environment and Chinese Database

1. Background and Analysis

-Because there are great number of Chinese internal codes, it is almost impossible to interchange Chinese information now. In order to establish an unified Chinese information environment, it is in great demand to integrate these different codes into a standard interchange code as soon as possible.

-The progresses in Chinese computer technology are made independently and therefore slowly. It is necessary to make technology interchange worldwide and to integrate technological developments at different locations.

-R.O.C. is the root of Chinese culture. It is necessary to supply Chinese culture to wherever there is Chinese people.

-R.O.C. will become a center of technology and finance in Asia. It is necessary to provide information on foreign trade, patent, finance, etc., to the world community.

-R.O.C. is also a marvelous place for sightseeing. It is necessary to advertise it to the world.

-Because there are huge number of databases in the world and users usually retrieve information via computer networks, we should increase our pace in catching up with their technical level.

-The amount of information import to this country is larger than its export to the world. It is necessary to increase the export of Chinese information.

-Almost all Databases in R.O.C. are operated independently. Most of them are developed for either the financial sector or the stock market. It is necessary to design an integrated database to include information on culture, foreign trade, patent, travel, news, etc.

2. Ideas and Assessment

Ideas:

-Make the international standard ISO 10646 or UNICODE, the consensus of which has already been reached among R.O.C., Mainland China, Japan and Korea, the international standard Chinese interchange code among different areas.

-Hold Chinese computer technology development seminars in the country and abroad; integrate domestic and overseas technological developments in Chinese computing.

-Build domestic distributed Chinese database system and hook it up with overseas Access Centers via OSI computer network and make

Chinese information available and accessible readily to Chinese people worldwide.

-Hook up overseas Access Center with domestic network via international packet switching network and have overseas users share our culture resource at a low cost.

-The preliminary list of these databases includes:

(1)Chinese bibliographic and books information at National Central Library

(2)Patents and registered trade marks of National Bureau of Standards

(3)International trading information of China External Trade Development Council

(4)Daily news from Infotimes Co.

(5)Foreign exchange rate from Central Bank of China

(6)Domestic tour information from Tourism Bureau

(7)Weather forecast from Central Weather Bureau

(8)Chinese Computer Assist Instruction(CCAI)

(9)Stock market and Future Trade Market information

(10)Others

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Assessment:

-To bind Chinese people throughout the world together via telecommunication networks. Making them feel that the world is getting smaller and smaller and tying their strength with motherland.

-To add to our government's efforts to look after overseas Chinese. It will pay off in the long run. Overseas Chinese will offer their support in due time.

-To hold seminars on Chinese computer technology development to congregate experiences and achievements to overcome bottlenecks in Chinese input method, to unify character sets and coding methods, to integrate open system environment, and eventually to make the Chinese information interchange as smooth as silk without any hitch.

-To encourage cultural interchange across the strait which is the government's first step in our long-term exchange with mainland. It may promote open cross-strait exchange and hopefully will bring an early reunification of our country.

3. Proposed Solutions and Expected Results

Solutions:

-Set up a project with appropriate budget in DGT for network construction required by this plan. Coordinate authorities concerned to set up domestic Chinese databases and standards for communication interfaces. In order to interwork with major foreign computer networks, the interfaces should follow OSI standards.

-Cooperate with appropriate overseas agencies by DGT to setup access centers for access to domestic networks and Chinese databases.

-Work out favorable measures by DGT for increasing utilization of this network.

-Coordinate computer vendors to develop Chinese workstations in conformance to the UNICODE specification.

-Investigate the requirements and demand by III on database services by overseas Chinese, government agencies and local people.

-Cooperate with other authorities concerned by Chinese Institute of Electrical Engineering to sponsor seminars on Chinese computer technology to which experts and scholars from local, overseas, mainland and all over the world may be invited.

-Allocate budget by Council for Culture Planning, Mainland Affairs Commission, Overseas Chinese Affairs Commission for subsidizing the above mentioned construction works and seminars carried out by their respective agencies. Projects with cultural value should be subsidized from the budgets of government agencies concerned and those with commercial values could be opened to private sector to operate.

Expected Results:

-Chinese informations are made available to overseas users as well as local users.

-Our precious and valuable cultural heritages are made available and accessible to the whole world, such as Chinese bibliographic and books information and Chinese Computer Assist Instruction (CCAI).

-Interchange and cooperation across the strait and among all countries throughout the world through this network may increase tremendously, after direct communication is permitted.

-Every aspects of technological development in Chinese computing would be benefit from the cooperation and integration of international efforts and giant progress may be made. The door toward massive use of Chinese computer will be widely opened.

4. Implementation of Suggestion

- Four network Access Centers will be set up in Taipei, Washington D.C, Los Angles and New York. Aside from being communication server of the network nodes, they can be application servers for application systems. A back-end relational database server will be installed at Taipei network access center. The network configuration is shown in Figure 13 and Figure 14.

- The schedule of the pilot project of International Chinese Information Network System is shown in Figure 15.

- The budget of the pilot project of International Chinese Information Network is shown in Figure 15.

- The topics for the seminars on technology developments of Chinese language Computer system are shown in Figure 16. The Seminars

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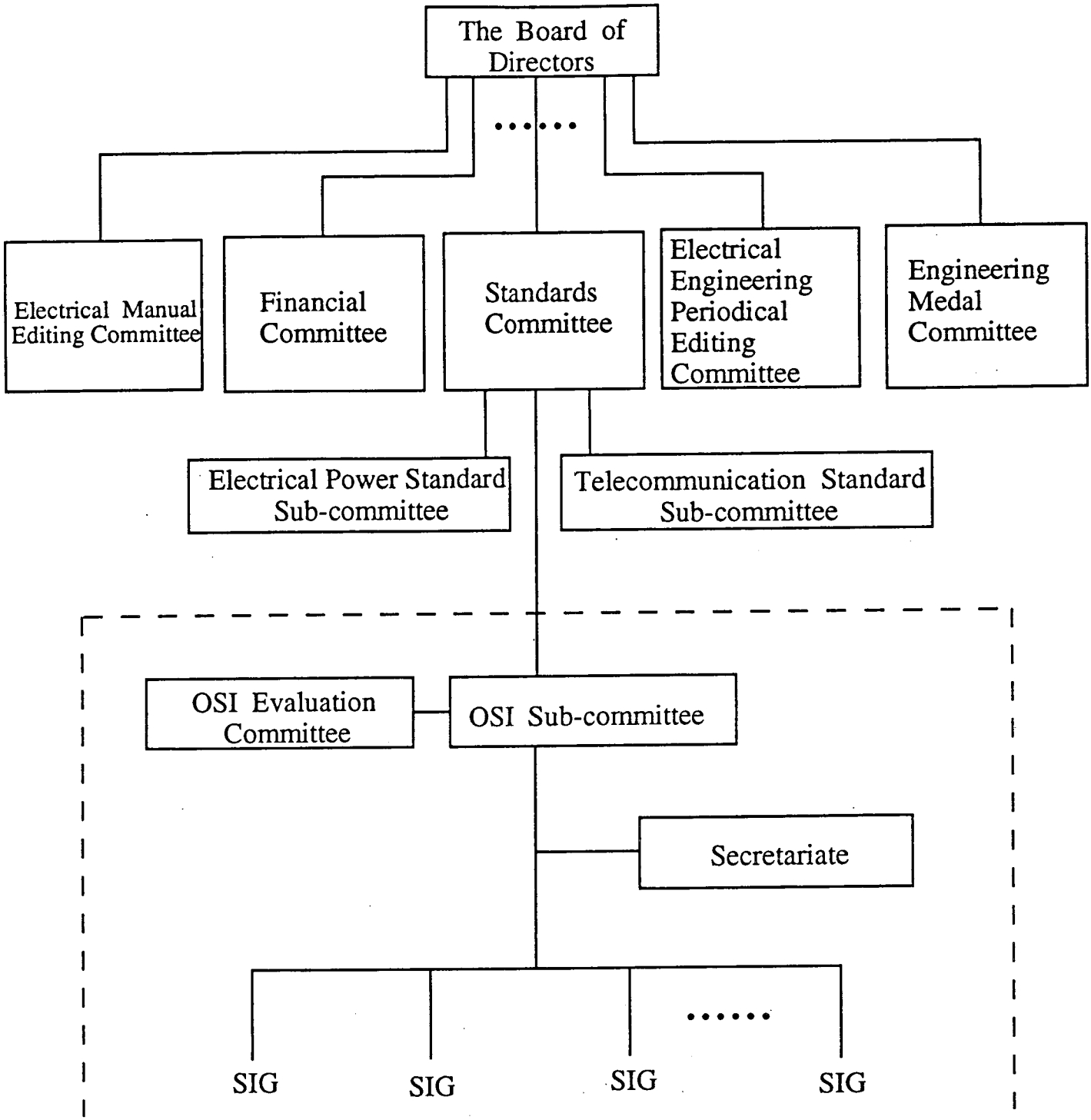
should be held annually and alternatively at local and overseas locations, and accompanied with product shows. The cost of holding these seminars and traveling expenses of attendants will be subsidized by the Council for Culture Planning and Development using special project appropriation.

4. Conclusion

Pilot International Chinese Information Network System is a symbol of our culture development and national image, and also an international express way for Chinese information, and then an outlet for exporting Chinese culture. The development and construction of this network, doubtlessly, would put implementation of communication standards in motion and make Chinese information available and prevailing throughout the world. It is an integration of Chinese, Culture, Computer, and Communication (C&C&C&C) into "A consolidated network of Dragon's Posterity" (Dragonet), extending it antennae into all the corners of the world.



(1) To be in effect on July 1, 1992

(2) AOW and three additional domestic Special Interest Groups shown in Figure 3.

Figure 1. Organization of OSI Sub-Committee with Chinese Institute of Electrical Engineering

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1. FTAM (File Transfer, Access and Management)
2. MHS (Message Handling System)
3. NM (Network Management)
4. DIR (Directory Service)
5. VT (Virtual Terminal)
6. TP (Transaction Processing)
7. ODA (Office Document Architecture)
8. EDI (Electronic Data Interchange)
9. LAN (Local Area Network)
10. WAN (Wide Area Network)
11. CUL (Common Upper Layer)
12. MMS (Manufacturing Messaging System)
13. DFR (Document Filing Retrieval)
14. PTS (Profile Test Specification)
15. Network Security
16. N&A (Naming and Addressing)
17. Interoperability

Note: 1. Group 1 to 14 are AOW's special interest groups,
Group 15 to 17 are domestic special interest groups.
2. Group 8 will be merged into group 2 (MHS).
3. Group 9, 10 will be merged into LL (Lower Layer).

Figure 2. The list of special interest groups

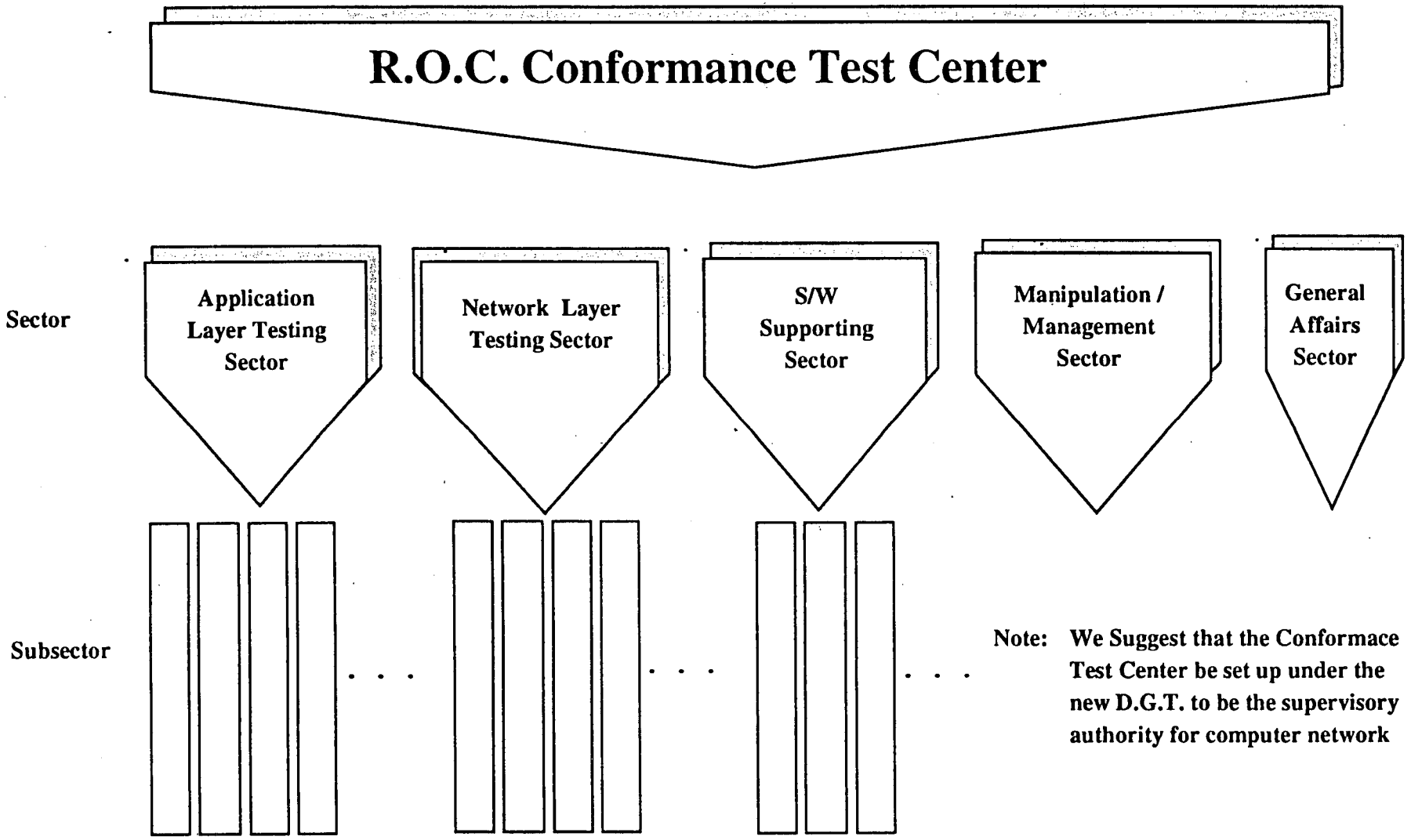


Figure 3 The Planned Organization of R.O.C. Conformance Test Center

Item / Fiscal Year	Item of Testing Service
82	File Transfer Access and Management protocol : FTAM Session protocol Transport class 0/2/3/4 protocol
83	Message Handling System protocol : MHS
84	Directory Service protocol : DS
85	Virtual Terminal protocol : VT Office Document Architecture protocol : ODA Transaction Processing protocol : TP
86	Remote Database Access protocol : RDA Network Management protocol : NM

Figure 4. The Schedule of Application Layer Testing Service

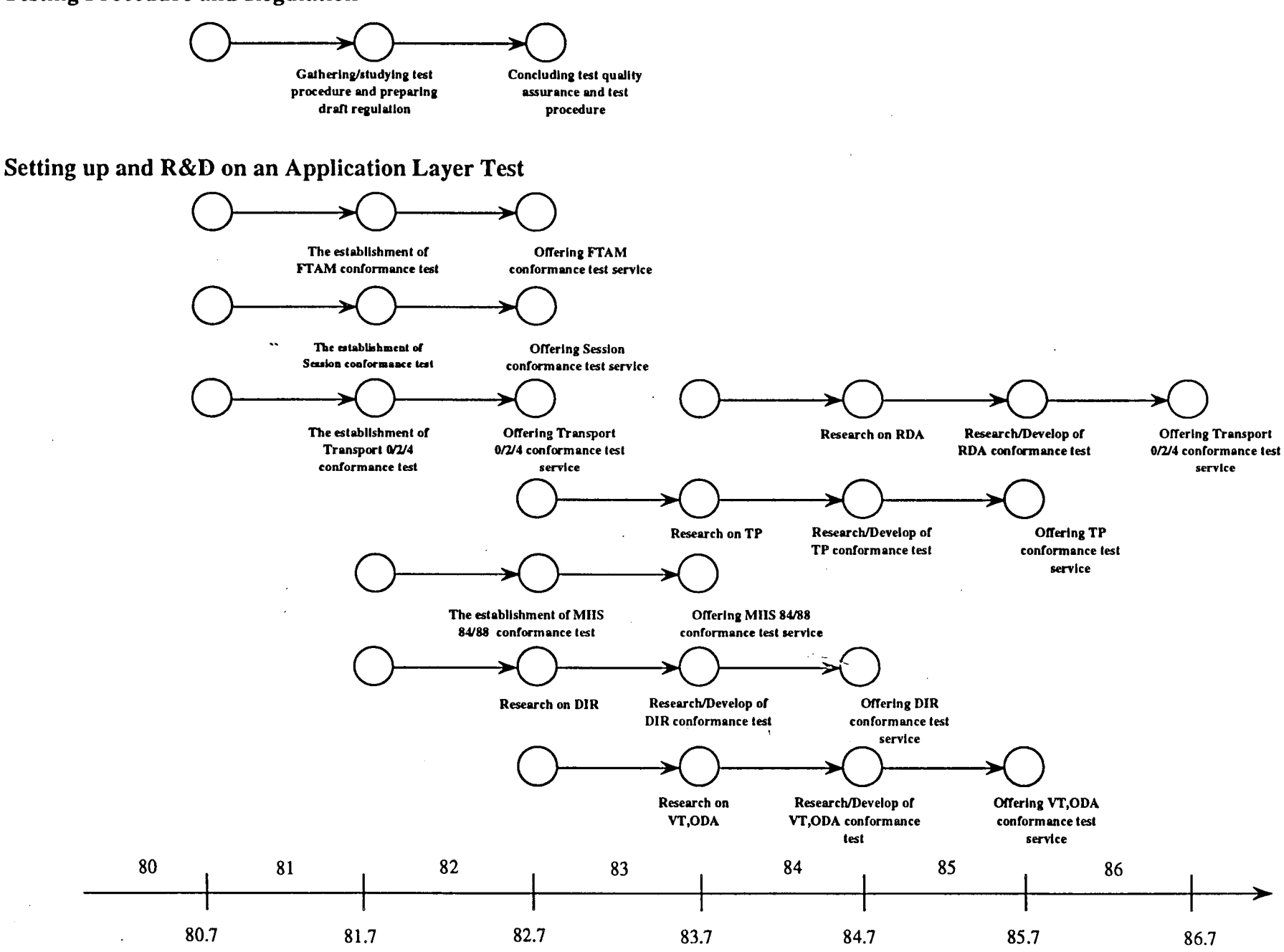


Figure 5 The Strategy of OSI Protocol Conformance Test Center (1)

Item / Fiscal Year	Item of Testing Service
83	Intermediate System to Intermediate System Routing protocol : IS-IS
84	Integrated Service Digital Network protocol : ISDN End System to Intermediate System Routing protocol : ES-IS ConnectionLess Network protocol : CL NP
85	Ethernet : 802.3 Token Bus : 802.4 Token Ring :802.5 Distributed Queue Dual Bus : DQDB
86	Broadband Integrated Service Network protocol : BISDN Fiber Distributed Data Interface :FDDI

Figure 6. The Schedule of Network Layer Testing Service

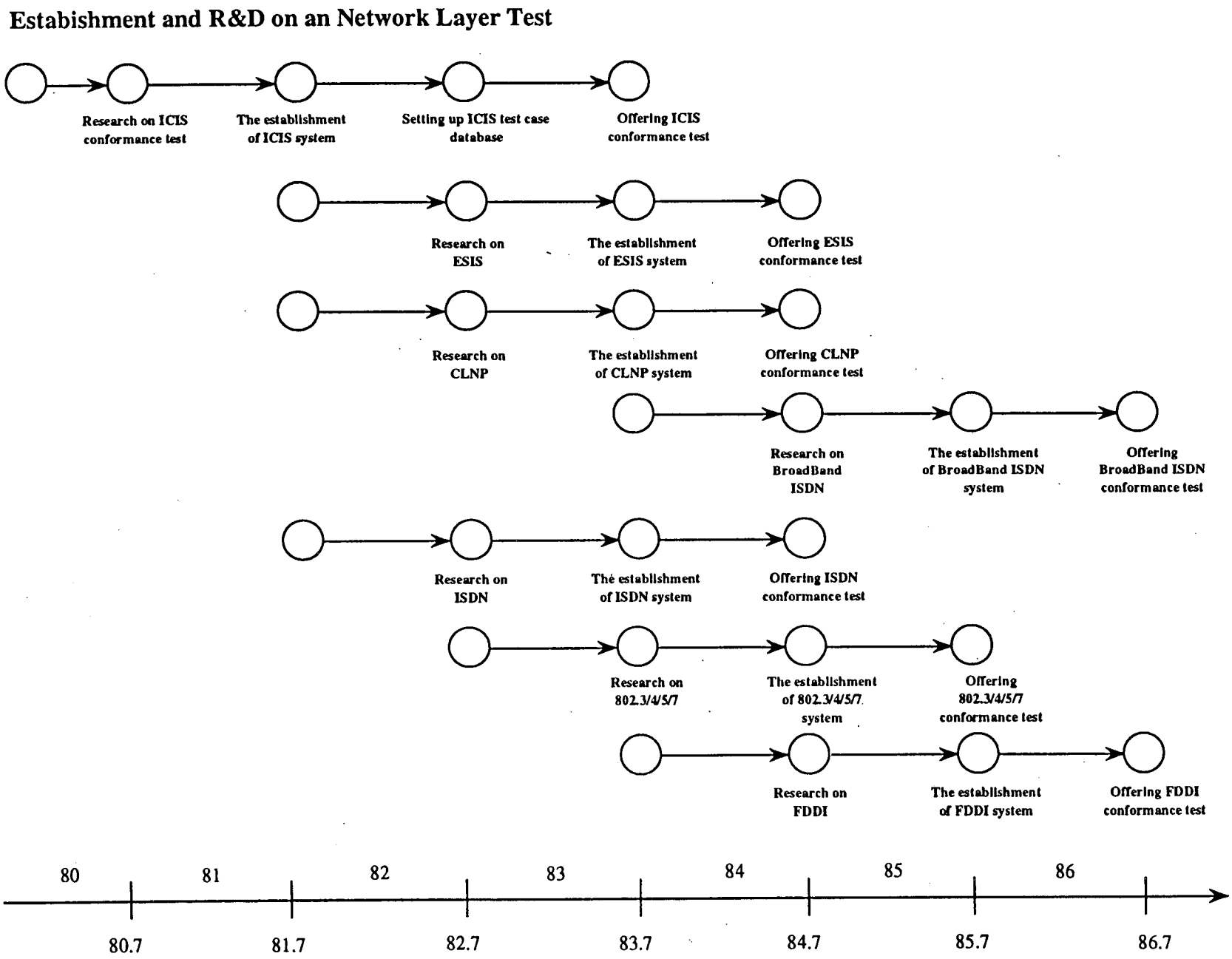


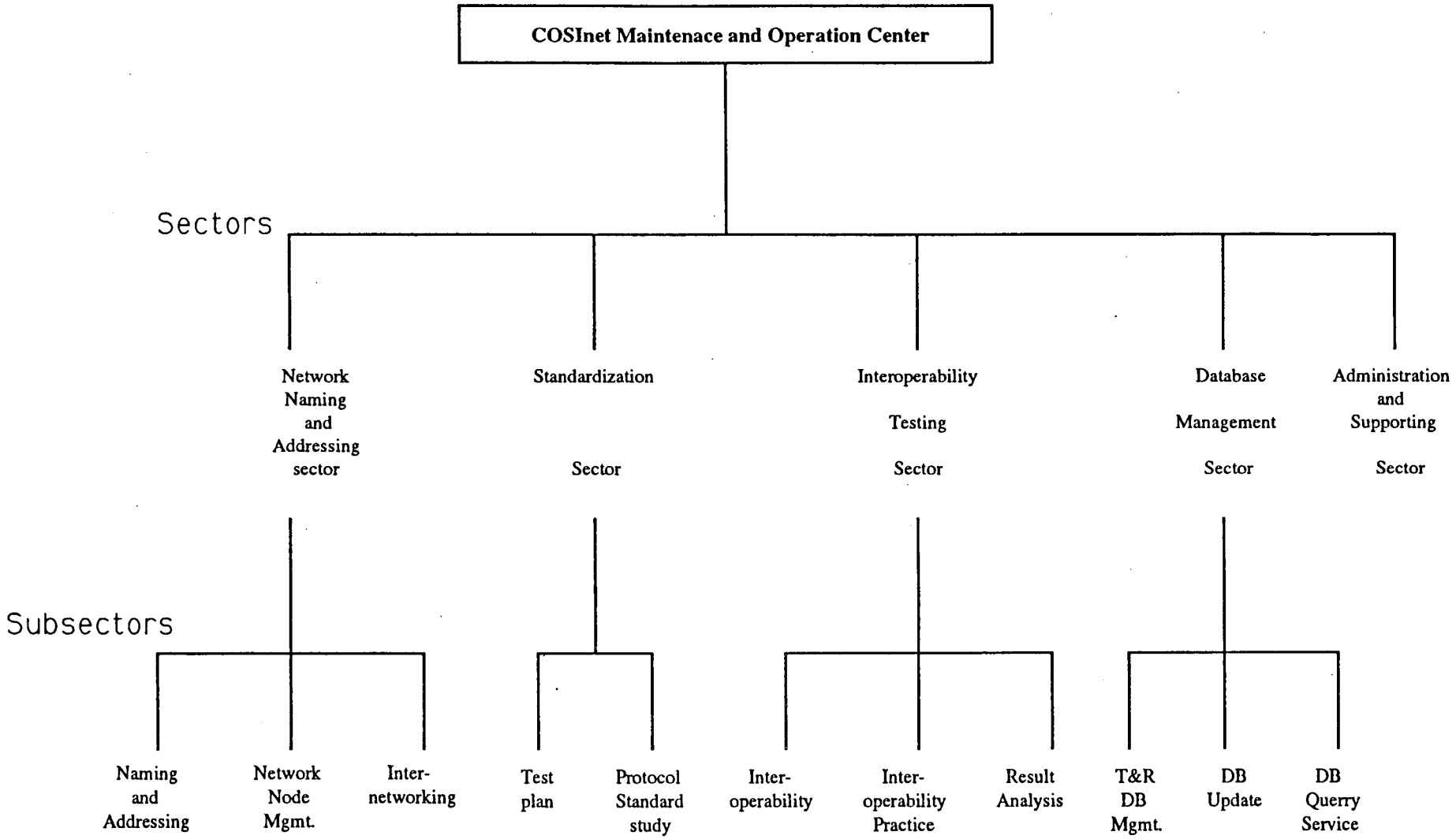
Figure 7 The Strategy of OSI Protocol Conformance Test Center (2)

Unit: NT $1000

Item \ FY	82	83	84	85	86	87	81-86 Total
1. Budget for Equipment	14,500	25,000	17,000	17,000	11,000	11,000	95,000
2. Current Expenditure	36,000	61,380	77,319	95,832	111,996	130,442	512,969

Remark:
1. Budget for personel cost is estimated by counting salary NT$50,000 per person per month and 15 months' salary per year.
2. Current expenditure= Budget for personel cost X 120% [20 % extra are required for the expenditure of general affair.]
3. Budget for equipment should be included in total budget.
4. Current expendeture should be paid from budget, and the deficits by special scientific and technique appropriation.

Fig. 8 Budget for OSI Conformance Testing Center



Note: we suggest that COSInet Maintenace and Operation Center be set up under DGT to be in charge of supervisory authority of computer network

Figure 9 The Organization Of Interoperability Testing Center COSInet

Unit: NT $1000

FY	82	83	84
Budget	11,000	16,000	21,000
FY	85	86	87
Budget	26,000	30,000	35,000

Figure 10. Estimated Budget for national OSI Standards Drafting and Promotion

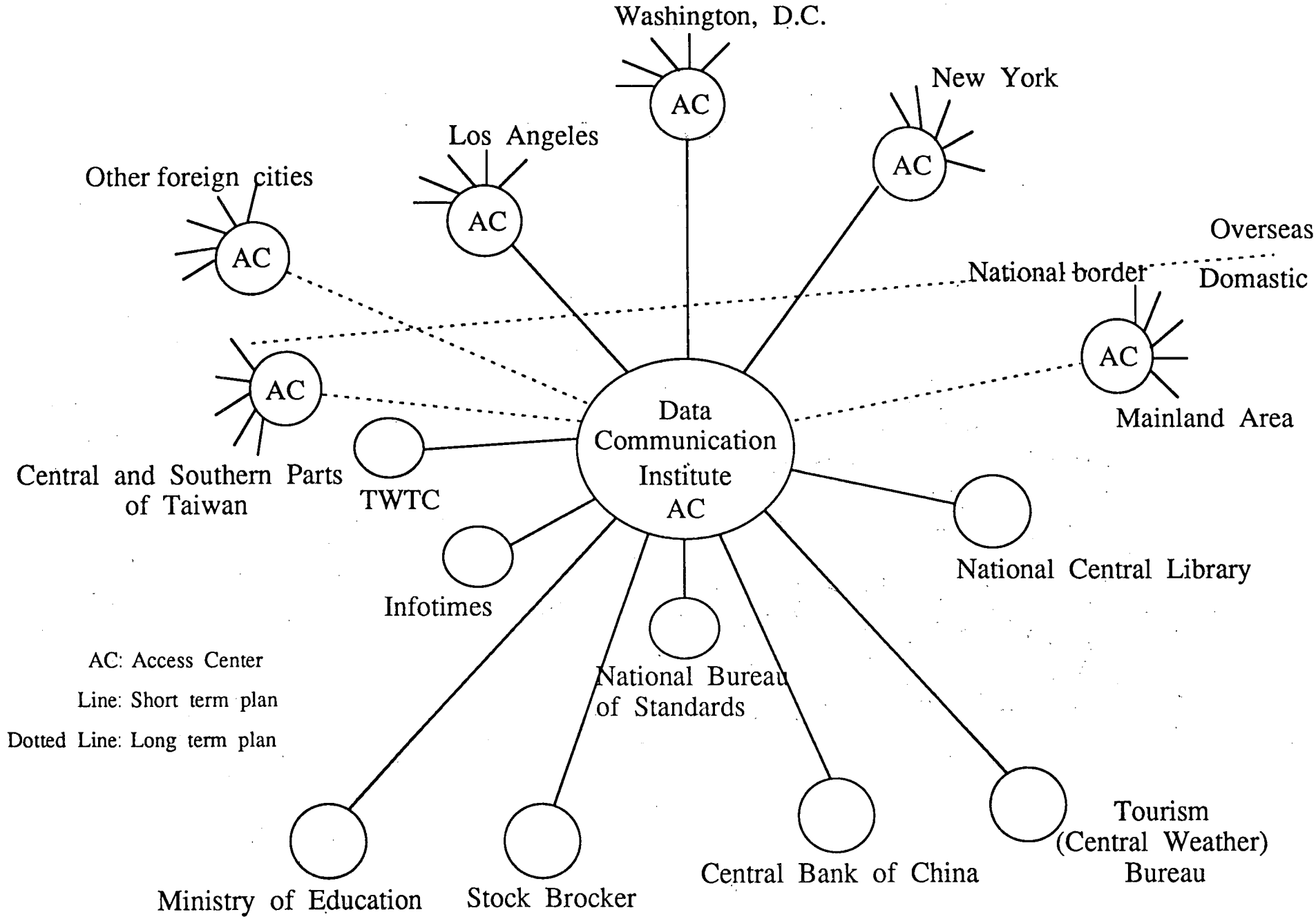


Figure 11. Network Architecture

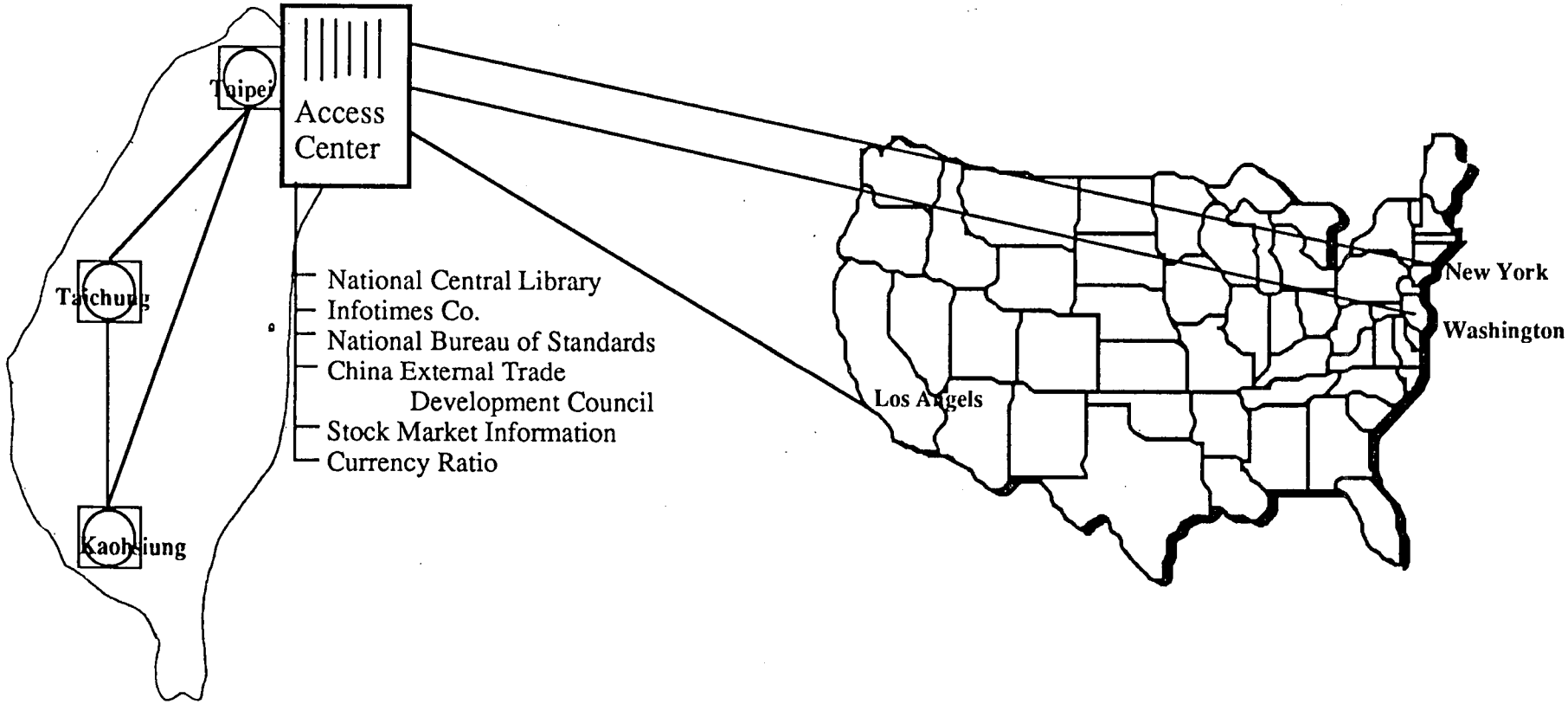
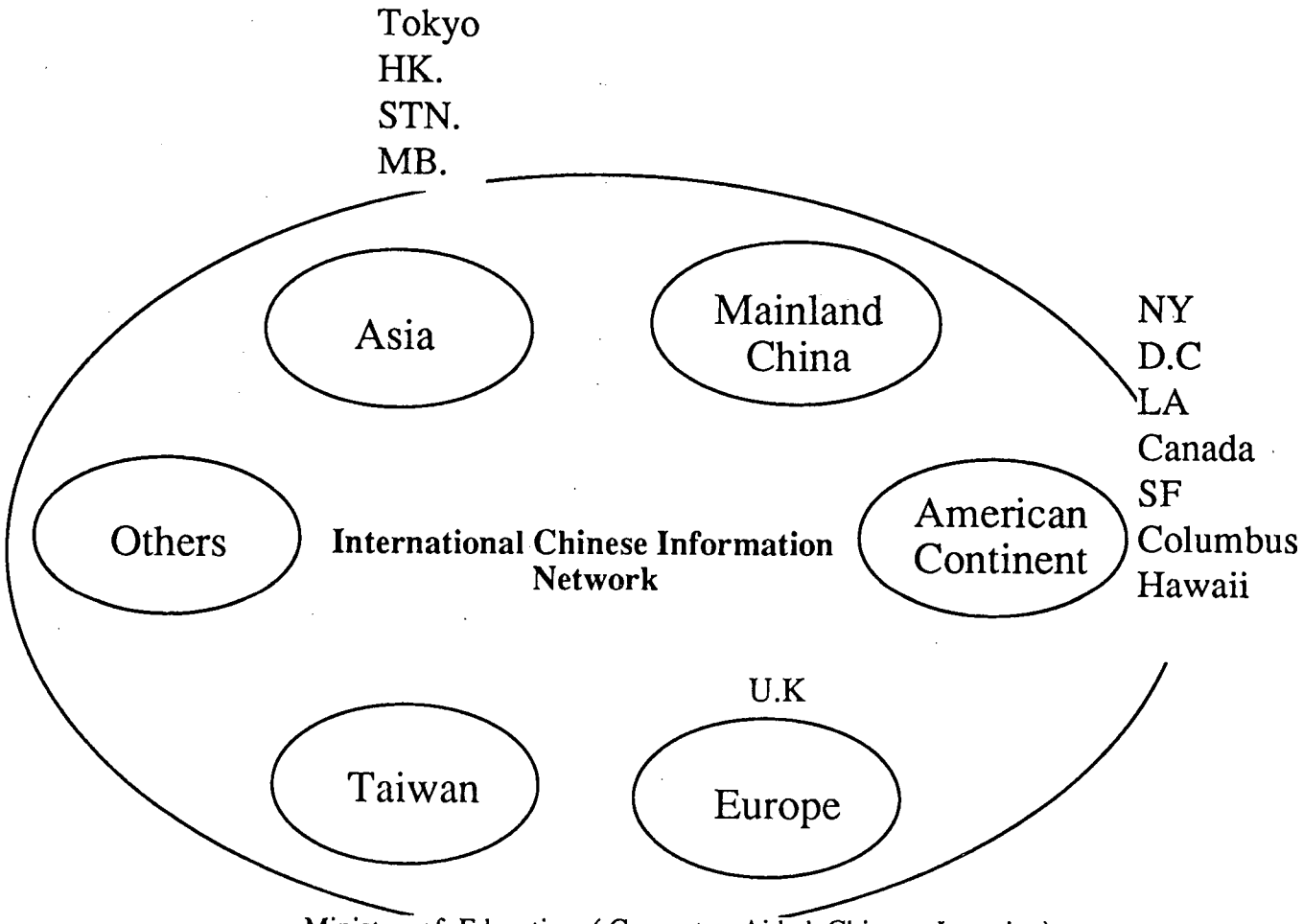


Figure 12. Preliminary Information Network



DataBase :

National Central Library (Chinese books)
National Bureau of Standards (Patent)
Infotimes (News)
China External Trade Development Council (Export)

Ministry of Education (Computer Aided Chinese Learning)
Tourism Bureau, Central Weather Bureau (Tourism and Weather Report)
Financial Information System Center (Stock Market and Future Market)
Center Bank of China (Foriegn Exchange Rate)

Fig 13. Long Term System Architecture

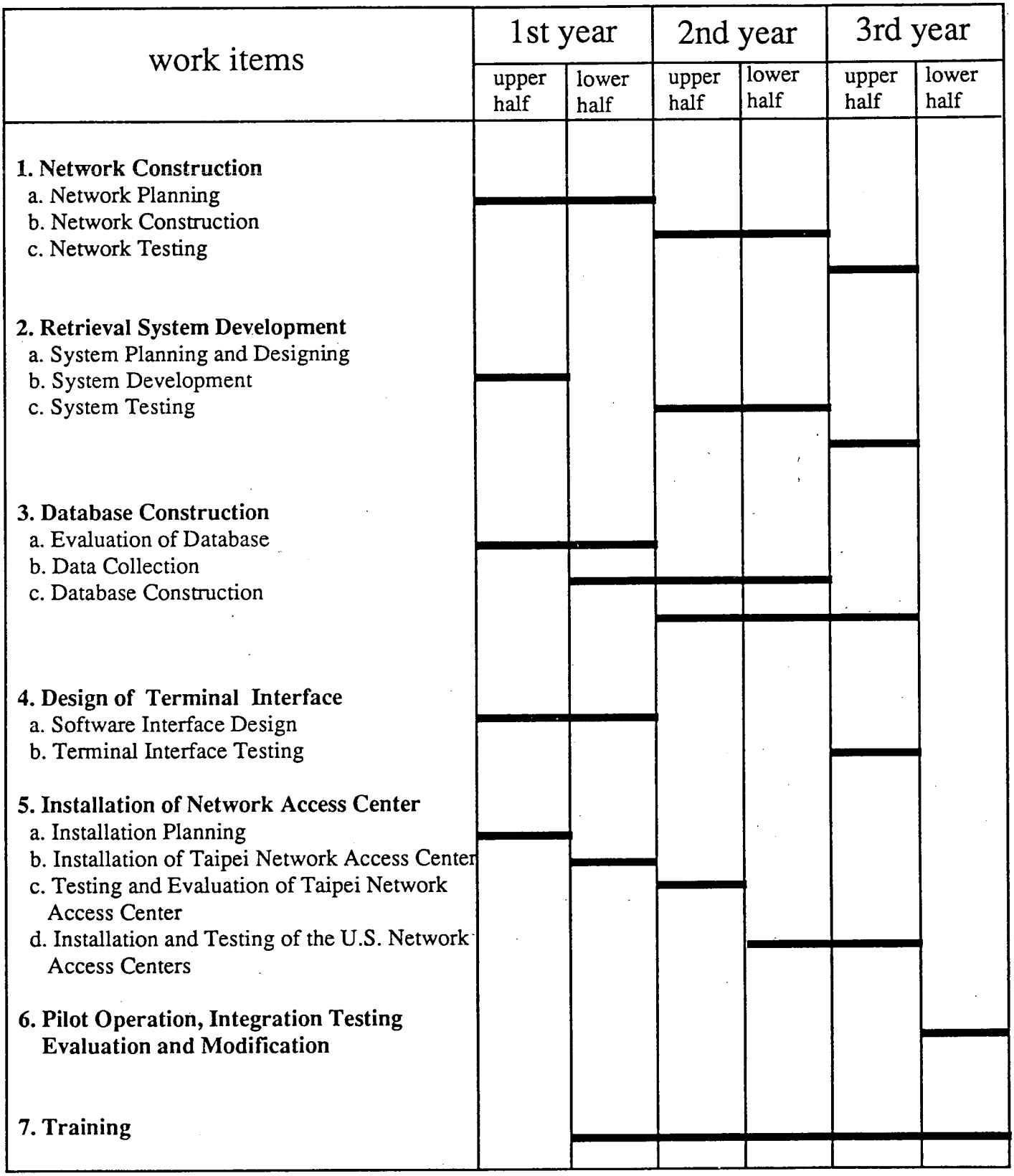


Figure 14. The schedule for the construction of the network and the databases

Unit: NT $1000

Items	1st year	2nd year	3rd year	total
1. Facility Expenditure	66,000	96,000	46,000	208,000
2. Software Procurement	50,000	70,000	30,000	150,000
3. Current Expenditure	20,000	30,000	40,000	90,000
total	136,000	196,000	116,000	448,000

Fig 15. Estimated Budget for Pilot International Chinese Information Network

380

66

A. Input Method:

1. Traditional Keyboard Input Method
2. Scanner Input Method (Font Recognition Technique)
3. Handwriting Input Method (Font Recognition Technique)
4. Voice Input Method (Voice Recognition Technique)

B. Output Method

1. Font Generation Technique
2. Font Standard
3. Chinese Publishing Technique
4. Voice Synthesis Technique
5. Chinese Display Technique

C. Character Set and Coding

1. Universal Character Set and Coding
2. ISO 10646 and UNICODE
3. Integration with ISO 10646 or UNICODE

D. Open Chinese Computer System Environment

1. Programming Language
2. Database Access
3. Communication Software
4. Operating System
5. Windows

Fig 16. Topics for Chinese Computer Technology Development Seminar

Network Information System / Main Features	BITNET	INTERNET	SEEDNET	STICNET	TANET
Network protocol	NJE (IBM)	TCP/IP	TCP/IP	WSN	TCP/IP
Representation of Chinese Information	IBM Code	No	CNS 11643	WANG Code	IBM Code
System Configuration	Terminal Emulator	Terminal Emulator	Terminal Emulator + Client-Server Structure	Terminal Emulator	Terminal Emulator
Automatic Forwarding	No	No	No	No	No
Integrated Chinese Database	few	No	few	few	few
Key Features	Communicable with universities and academic research institutes all over the world.	The world's largest network, originated from the communication demand of U.S. DoD.	Providing necessary information, methodologies, standards, and tools to boost the developing ability and productivity of domestic software developers.	Providing a technical information system for domestic researchers.	Part of a domestic academic network.

Table 1. A survey of current information networks

先導性國際中文資訊網路系統

主辦單位：交通部電信總局

協辦單位：資訊工業策進會

中華民國八十一年六月二十四日

背　景　分　析

□ 經濟活力充沛，惟資訊流通各成一系

— 加值網路服務

— 一千多資料庫

— 政府機關行政資訊網路計畫

— 不同廠牌電腦系統不易互通資訊及檔案

□ 增強國際地位，善盡歷史文化責任

— 資訊輸入 ＞ 資訊輸出

— 對海外僑胞之資訊服務

— 中國文化與現代科技之結合

□ 國際資訊與通訊標準一一浮現

— ISO-10646 及萬國碼

— OSI通信協定標準化

目　　標

□ 建設先導性國際中文資訊網路系統

— 整合多樣化、多語言的我國資料庫
（文化、學術、教育、觀光、外貿、專利、金融等）

— 提供全球中文資訊之服務

□ 協助推廣國際資訊與通訊標準

— 中文及外文標準交換碼 (ISO 10646 及 UNICODE)

— 開放式系統互連通信標準 (OSI)

建 議 方 案 之 一

□ 資訊與通訊標準之推廣

— 中文及外文標準交換碼ISO 10646及 UNICODE之推廣

○ 資策會與台北市電腦公會等

○ 中文工作站先期發展

— 中文電腦技術發展之整合

○ 舉辦國際研討會（圖十六）

○ 輸入法、輸出法、標準字形等

— 開放式系統互連通信協定標準之研擬及推廣

○ 中國電機工程學會設開放式系統互連分組委員會（圖一）負責標準草案之研擬及推廣工作（圖二）

○ 中央標準局及亞太科技協會贊助

○ 各研究單位、資訊業界、學者專家共同參與

— 開放式系統互連符合性測試與互運測試（圖三～九）

○ 行政院資訊發展推動小組指定電信總局辦理

建 議 方 案 之 二

□ 網路系統規劃與建設

○ 電信總局主辦

○ 網路架構：進出中心(Access Center)（圖十一）

短期：美國（圖十二）

長期：亞洲、歐洲、澳洲及中國大陸（圖十三）

○ 時程與預算（圖十四、圖十五）

建 議 方 案 之 三

□ 確定資料庫種類

○ 營利性與非營利性資料庫

- 前者開放民間經營，後者由政府編列預算輔助
- 資策會主辦市場調查

○ 資料庫例子（圖十一～圖十三）

- 中央圖書館中文書籍典藏
- 中文電腦輔助教學
- 觀光局國內旅遊指引與報導
- 學術論文
- 專利與商標
- 金融（股市、期貨與匯率）
- 外貿商品
- 即日新聞

建 議 方 案 之 四

□ 網路系統推廣策略

— 電信總局：研訂國外優惠使用辦法

— 駐外單位：當然使用者並協助巡迴推廣

— 非營利性項目：

○ 政府有關機關輔助

— 營利性項目：視同國際加值網路服務

結　　語

□ 中華文化與電腦通信技術的結合 (C&C&C&C)

— 文化與國家形象之表徵
— 資訊與通訊標準化之網路
— 國際「資訊高速公路」
— 龍的傳人團結之網 (DRAGONET)

□ 討論子題

1. 開放系統互連 (OSI) 之標準技術與網接技術
   - 標準研擬專責機構
   - 參與機構與人員
   - 所需經費來源
   - 標準的公佈與推廣
2. 統一化之中文資訊環境與中文化資料庫
   - 資料庫種類
   - 使用推廣辦法
   - 統一化之中文碼
   - 統一化之中文環境
   - 建設地區

PILOT PROJECT

of

INTERNATIONAL CHINESE INFORMATION NETWORK SYSTEM

Directorate General of Telecommunications, MOTC

Institute for Information Industry

June 24 , 1992

BACKGROUND AND ANALYSIS

- ☐ Vigorous Economic Activities Induce Enormous Information Processing and Sharing
  - — VAN (Value Added Network) Services
  - — Over 1,000 Databases
  - — Administrative Information Network Plan
  - — However, Different Vendors' Computer Systems Cannot Interoperate Easily
- ☐ Improve National Stand & Historical and Cultural Responsibility
  - — Inbound Information greater than Outbound Information
  - — Information Services for Overseas Chinese
  - — Marriage of Chinese Culture and Modern Technologies
- ☐ Recent Maturity of International Information & Communication Standards
  - — ISO 10646 and UNICODE
  - — OSI Communication Protocol Standardization

OBJECTIVES

- ☐ Establish Pilot Project of International Chinese Information Network System
  - — Integrate Diversified and Multi-lingual Chinese Databases

    (Culture, Academy, Education, Tourism, Trade, Patents, Finance, etc .....)
  - — Provide Chinese Information Services Worldwide
- ☐ Promote International Information & Communication Standards
  - — International Chinese Interchange Code (ISO 10646 & UNICODE)
  - — Open System Interconnection (OSI) Standards
  - — Breaking the Barriers in Information Network Systems

PROPOSED SOLUTION 1

☐ Promotion of Information & Communication Standards

— International Chinese & Foreign Languages Interchange Code (ISO 10646 & UNICODE)

- O Help Promotion : III & Taipei Computer Association (TCA)
- O Help Implementation of Chinese Workstation Open Environment : III & TCA

— Integration of Technologies for Chinese Language Computer System

- O International Forum (Figure 16)
- O Input Methods , Output Methods , Standardization of Fonts , etc.

— Promotion of OSI Protocol Standards

- O Responsible Organization : OSI Sub-committe / Standard Committe / Chinese Institute of Electronic Engineering (CIEE) (Figure 1)
- O Sponsoring Organizations : National Bureau of Standards (NBS), Asia Pacific Council for Science and Technology (APCST) , etc. (Figure 2)
- O Participating Organizations : DGT , ITRI , III, FISC , COSA , Vendors , Personnels : Scholors & Experts from Universities

— OSI Conformance Test Center & Interoperability Test Center (COSInet) (Figure 3~9)

- O Setup : DGT's Telecomm. Lab.
- O Operation : DGT's Supervisory & Management Dept.

PROPOSED SOLUTION 2

☐ Planning and Construction of Network System

- O DGT Main Responsibility
- O Network Architecture : Establish Access Centers (Figure 11)

  Short Ferm : US (Figure 12)

  Long Term : Asia , Europe , Australia , Mainland (Figure 13)

- O Schedule & Budget : Figure 14 & Figure 15

PROPOSED SOLUTION 3

☐ Confirm Catagories of Databases

—— Profitable vs. Non-Profitable Databases

- Former Privatized , Latter Government Subsidized
- III helps Market Survey

—— Data Base Examples : (Figure 11 ~ Figure 13)

- Chinese Bibliographic & Books Information at National Central Library
- Chinese CAI from Univ.
- Domestic Tour Information from Tourism Bureau
- Academic Research Papers from Univ. Lib.
- Patents & Trade Marks from NBS
- Financial Information (Stocks , Future trade Market, Exchange Rate)
- Daily News

etc.

PROPOSED SOLUTION 4

☐ Promotion Strategy of the Network System

— DGT : Study on Favorable Rate for Foreign Users

— Foreign Agencies : Default Users , Help Promotion Trip Abroad

— Non-profitable Items

- Government Subsidies
- New Database : III help planning

— Profitable Items

- Similar to International VAN Services

CONCLUSION

- ☐ Marriage of Chinese Culture & Computer Communication (C&C&C&C)
  - — Symbol of Culture & National Image
  - — Network System Using Information & Communication Standards
  - — Network System Representing R.O.C.
  - — 「International Chinese Information Express Way」
  - — A Consolidate Network of Dragon Posterity (DRAGONET)

- ☐ Subtopics for Further Discussion

1. Standard Technology & Network Connectivity Technology for Open System Interconnection (OSI)
   - ● Dedicated Organization
   - ● Participants
   - ● Founding
   - ● Standardization Process & Promotion
2. Unified Chinese Information Environment & Chinese Databases
   - ● Catagories of Databases
   - ● Promotion Strategy
   - ● Unified Chinese Internal / Exchange Code
   - ● Unified Chinese Operation Environment
   - ● Construction Area for Access Centers