ASEAN Cooperation Project Document

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Project No.:

Project Title:

TECHNOLOGY **A**SSESSMENT FOR **U**NIVERSAL SERVICE OBLIGATION PRACTICES IN ASEAN MEMBER STATES (τ (tau)-Project)

Project Description:

The project brief indicates an term of reference for participating member states and its dialog partners to assess the current technology options for ASEAN countries and provide a recommendation of USO implementation in various countries in the region.

Sponsoring ASEAN Body

Sectoral Committee/Main Body:

Meeting Number/Date:

Working Group/Sub-Committee:

Meeting Number/Date:

Proponent's name and address:

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1. PROBLEM TO BE ADDRESSED

In ASEAN, as elsewhere, telecommunications markets are being liberalised. The liberalisation process is expected to enhance efficiency, lower costs and reduce prices for the consumer. In turn, new services are developed and the quality of service improved. For society as a whole, the net effect is a general rise in welfare. However, within one specific area of telecommunications, universal service, the effects of liberalisation are not always so clear.

Telecommunication is a fastest growing industry that plays an important role in achieving development objectives. Universal service obligation has been a central focus of the development in telecommunication sector contributing to larger development objectives of reducing poverty through creating access for rural community to information and thus new opportunity to improve their livelihood. It further enables rural community, poor people and least developed regions to exploit their social and economic potentials.

International Telecommunication Union (ITU) in 1998 has defined universal service and access broadly as:

- Universal Service is to achieve availability, non-discriminatory access and widespread affordability of telephone services. Universal Service is in general a per-household concept measured by the percentage of households with a telephone.
- Universal Access is taken to mean that each person is within a reasonable distance of public-access telephone.

Organisation for Economic Co-operation and Development (OECD) in 1997 has defined universal access as the requirement that telecommunications operators provide basic voice telephone service to all who request it at a uniform and affordable price even though there may be significant diiferences in the costs of supply. In the respect Unviersal Service includes: (1) universal geographic access; (2) universal affordable access; (3) universal service quality; (4) universal access by the disabled; and (5) universal accessible tariffs.

In developed countries with almost ubiquitous telecommunications coverage, providing a universal service usually does not involve major new network roll-out, but rather the connection of customers to existing network facilities. In contrast, in developing countries, providing a universal service is likely to involve major expansion of the basic network into new localities.

Universal service obligation (USO) that was coined by ITU has been the driving force for narrowing the gap between urban and rural area. The government will assume the responsibility for ensuring that this minimum standard is met. For Indonesia, the criteria for universal service and access are defined as a basic telephony service with at least 9.600 Bps. The target recipient for such service is one telephone line in a village – paying similar call tariff with normal (fixed line) telephone use. In other country, the definition may differ according to the agreed criteria – such as access to targeted less wealthy community in the UK or based on the predetermined telephone density, such as in Malaysia and Hungary.

Universal service is the concept that every individual, in a given country, is entitled to some basic level of telecommunication service at an affordable price. The economic rationale for universal service obligation (USO) is that in the absence of obligation (involving some form of state intervention) the socially optimal amount of telecommunications services will not be provided i.e. left to itself, the market would leave some areas (for example those displaying low population densities, or difficult topography) un-served.

The ASEAN Member Countries (AMC) have in the Ministerial Understanding on ASEAN Cooperation in Telecommunications and Information Technology (signed in July 2001) that called for program implementation to bridge the digital divide within ASEAN by enhancing access to and use of telecommunications and IT. In the latest Vientiane Action Program (VAP) signed in November 2004, the section on telecommunications and IT will include program to leverage on ICT via public-private sector partnerships and strong linkages, to build a connected, vibrant and secure ASEAN Community.

Technology selection is critical to serve the objective of Universal Service Obligation (USO) implementation. Available technologies and their consequence on human resource in technically and administratively managing the service are important aspects in assessing and prioritizing technology options for different circumstances. The costs for planning, procuring, operating and maintaining the service are another important consideration for introducing a particular technology option.

The project indicates the needs of USO current technology options assessment for ASEAN countries and provides a recommendation of USO implementation in various countries in the region.

2. BACKGROUND, PROBLEM ANALYSIS AND JUSTIFICATION

2.1. BACKGROUND

Current technology options for delivering universal service obligation are basically similar to non-USO telecommunication services. They consist of a fixed line, wireless local loop, point-to-point radio/microwave, and VSAT. Such technologies are available in domestic market and produced by local manufacturer as well as imported from other countries. They are obviously different in its nature and its consequence. The following table indicates the feature and its implementation issues.

Table 1: Telecommunication technology options, characteristics and issues

Technology	Characteristics	Issues
Fixed Line	▪ Most cost effective ▪ High reliability ▪ Low maintenance rate ▪ High user density	▪ Limited by distance (~5 Km) ▪ Physical labor intensive ▪ Dependent on other infrastructure ▪ Terrain dependent
Wireless Local Loop	▪ Farther distance (~10 Km) ▪ Medium user density	▪ Higher cost ▪ Require other infrastructure ▪ Lower possibility of terrain obstruction
Point to Point Microwave	▪ Farther distance (15+ Km) ▪ Medium user density	▪ Higher cost than WLL ▪ Require other infrastructure ▪ High possibility of terrain obstruction
VSAT	▪ Unlimited distance ▪ Almost independent of other infrastructure ▪ Relatively simple and quick to deploy ▪ Low user density	▪ Highest cost of deployment and operational ▪ Highest frequency of maintenance
Other portable fixed satellite	▪ Unlimited distance ▪ Almost independent of other infrastructure ▪ Relatively simple and quick to deploy ▪ Low user density	▪ Low costs of deployment ▪ Possibility of higher costs of usage – depending on the tariff structure

The above table indicates the distinct characteristics of technology. The final option for the country is obviously *hybrid/mixed interconnection medium*, indicating localities and practicability of adopting such technology options and technology mix. In determining technology applicable to a particular situation, several criteria can be developed, such as:

- Compatibility with the standard
- Interoperability/integration
- Upgradeability

- Scalability
- Transparency for administration purposes
- Non-obsolescence
- Availability
- Suitability
- Proven
- Robust
- Terrain compatible

In the case of Indonesia, the government has also adopted a multi criteria evaluation technique indicating a combined bottom-up and top-down approach in procuring and deploying the equipment. This technique is adopted particularly in response with the decentralized system currently underway in Indonesia and many other developing countries.

Implementation of such technologies in each country will contribute different level of telecommunication sector development in the region. Within ASEAN member countries, there are different stages of development as shown below.

Table 2: The different stage of telecommunication sector development in ASEAN member countries.

Stages	**Emerging**	**Evolving**	**Embedding**	**Extending**
Key Characteristics	Low penetration of communication infrastructure (power, fixed line, cable TV, cellular)	Moderate to low penetration of communication infrastructure (power fixed line, cable TV, cellular)	High penetration of communication infrastructure (power fixed line, cable TV, cellular)	Very high penetration of communication infrastructure (power fixed line, cable TV, cellular) Broadband internet access services gaining popularity
	Low penetration of terminal devices (PC/ cellular phones)	Moderate to low penetration of terminal devices (PC/ cellular phone)	High penetration of terminal devices (PC/ cellular phone)	Very High penetration of terminal devices (PC/ cellular phone)
	Generally closed market condition for communication and ISP sector	Mostly liberalized market condition for communication and ISP sector	Mostly liberalized market condition for communication and ISP sector	Liberalized market condition for communication and ISP sector
	Key indicators: Teledensity < 5%, PC penetration < 1%	Key Indicators: Teledensity 5-10%, PC penetration 2-5%	Key Indicators: Teledensity 20-40%, PC penetration 5-10%	Key Indicators: Teledensity > 40%, PC penetration > 20%
Countries	Cambodia, Laos, Myanmar, Vietnam	Thailand, Philippines, Indonesia, Brunei	Malaysia	Singapore

Source: BusinessWorld Online, Inc. 2002

For ASEAN member states to learn together and developing a recommendation for USO implementation will provide a valuable knowledge other countries have experienced. In the short term it will cut costs for decision-making process and further speed up the execution of universal access policy. In medium and long term, the exercise will help policy makers to focus on the

achievement of ASEAN vision, Hanoi Plan of Action (HPA) and Vientiane Action Plan (VAP) in narrowing the information gap among communities and between ASEAN member states.

The implementation of Universal Service Obligation especially in ASEAN member states such as in Indonesia and Malaysia is described as the following table.

Table 3: The implementation of Universal Service in ASEAN member states (cases: Indonesia and Malaysia).

Indonesia	Malaysia
Low teledensity in rurals (0.2 %), ± 43.022 villages (64.4 % out of 66.778 villages) have-no telephone access, need more investment mostly in villages with no-access.	The teledensity rate for Malaysia or the number of telephone lines per 100 people is about 19.8%.
The Universal Service Obligation (USO) in Indonesia: ▪ "Community Access Within Walking Range" ▪ Provision of basic telephony services, Priority will be given to areas with: existing technical support (site, electricity, and if possible; nearest to a telephone central), economical potency ▪ USO will be a long-term, continuous and sustainable process. ▪ The name of USO Programme Implemented is "Telepon Perdesaan"	The Universal Service Provision (USP) is aimed to improve accessibility and availability communications services particularly to the rural areas, the provision of basic telephony, public payphone and internet access services The Government has recently announced to reduce the Digital Divide between the rural and urban areas through programmes such as Infodesa, Internet Desa, USP and computer infrastructure for rural schools.
▪ It has been implemented starting 2003. ▪ By the end of Year 2005 every district capital and village in Indonesia will be provided with basic telephony service (including fax,dial-up internet and low speed data/9600 Bps). ▪ Each village will be provided with at least 1 Line Unit (Universal Access) ▪ Normal rate will be applied and certain additional costs (such as frequency use, interconnection) will be temporarily waived.	▪ It has been institutionalized and implemented starting 2002. ▪ There is a special rate available for dial-up internet access service and it is not limited to those in the rural areas. The rates for the dial-up internet access service through the usage of special 151x code is regulated at 1.5 sen per minute for network communications charges and 1.0 sen for internet access charges
The technology choice: ▪ Implementation-1: VSAT, and Portable Fixed Satellite (PFS) ▪ VSAT, PFS, Radio, Cellular, IP-Based	The current technology choice: ▪ Radio in Local Loop (RiLL) ▪ Code Division Multiple Access (CDMA) ▪ Other emerging technologies with potentials are digital satellite services, xDSL, wireless LAN and Broadband Fixed Wireless Access (BFWA).

2.2. PROBLEM ANALYSIS AND JUSTIFICATION

2.2.1. Problem Analysis

Technology selection is crucial in USO implementation. An appropriately selected technology ensures the effectiveness of USO implementation. Furthermore, it will improve USO's sustainability through the assurance of the chosen technology's sustainability in the future.

While an ASEAN country wishing to implement USO can learn from other countries in selecting the best technology option, there are two factors that can potentially fail the effort. Firstly, technology selection is always suited to local situations. A country's experience cannot be automatically adopted in other countries due to different characteristics of countries. Differences in social, economic, and geographic aspects may pose difficulties in selecting the most appropriate option.

Secondly, even though the localization issue can be solved, learning from other countries' experiences is still difficult. Current telecommunication development in many countries (including its technology) is the result of implementation of telecommunication system that mainly supported by telecommunication industries with commercial schemes.

Implementation of telecommunication technologies for commercial purposes has different consideration compared with implementation of such technology for USO, which makes it inappropriate for providing telecommunication services for rural area.

In summary, there is a strong indication that regional experiences for implementing telecommunication technology for USO program is not sufficient as a base line for ASEAN member states in implementing USO program, so a specific study is crucially required.

2.2.2. Regionality

ASEAN vision 2020 sets out the partnership in dynamic development that will forge economic integration within ASEAN. The direction will be achieved by various instruments, among others by promoting a modern and competitive SME, integrating telecommunication networks through greater interconnectivity and enhance human resource development. In the area of social development ASEAN sees all people in the region enjoy equitable access to opportunities for total human development regardless of gender, race, religion, language, or social and cultural background. This vision has been followed by the Hanoi Plan of Action (HPA) which will end in 2004 and subsequent Vientiane Action Plan (VAP) 2004-2010. Nonetheless the plan has laid out the important plan to establish ASEAN Information Infrastructure.

In the Fourth ASEAN Informal Summit, 22-25 November 2000, Singapore, an e-ASEAN FRAMEWORK AGREEMENT has been agreed by member states with the objectives, among others, to promote cooperation to develop, strengthen and enhance the competitiveness of the ICT sector in ASEAN; and to promote cooperation to reduce the digital divide within individual ASEAN Member States and amongst ASEAN Member States.

The objectives are indeed serving larger development objectives larger than a mere introduction of technology in the government and business system among ASEAN member countries. The advancement of technology in the ASEAN region should contribute to the economic and development objectives sets in the HPA and VAP. ASEAN Plan of Action on Rural Development and Poverty Eradication for example, is a pathway and a commitment towards eradicating poverty, with particular emphasis on promoting the development of progressive, prosperous, and self-reliant rural communities, and thus contribute towards creating a caring society in the ASEAN Member Countries. Social development in the region should therefore be proactive in addressing emerging challenges arising from globalization, trade liberalization and closer regional integration.

With a limited regional experience for implementing telecommunication technology for USO program, it is difficult to reduce the digital divide and to promote cooperation to develop, strengthen and enhance the competitiveness of the ICT sector in ASEAN. Specific strategies for implementing telecommunication technology for implementing USO program therefore required. The strategy includes the appropriate technology for the national and regional telecommunication development. The assessment of the available technology will be useful for the ASEAN member countries to contribute the solution for the Universal Access and Digital Divide issues.

2.2.3. Participation

All ASEAN member countries will be expected to participate this project, especially countries that implement USO program.

2.2.4. Beneficiaries.

All ASEAN member countries that implement or will implement USO program will be the beneficiaries of the project. The benefit will be the knowledge of how other countries developing USO program, cost cutting for decision making process, speeding up the USO program execution, and after all help the policy makers to focus on the achievement of narrowing gap among countries and ASEAN member states.

2.2.5. Commitment and sustainability

Some member countries has implemented USO program. In the past two years, Indonesia has implement USO program through the KPU program of Ministry of Communication. The target is implementing more than 40,000 telephones at the rural area around Indonesia. The Indonesia government has spent some budget for this implementation at the first two years. The government also have agreement from 2 main telecommunication provider companies (PT. Telkom and PT. Indosat) to share 0,75% of the profit to sustainability aspect of the program. In Malaysia sustainability of USO program also has been supported by commitment of telecommunication operator to contribute 6% of net revenue.

In the long term, sustainability of USO program can be expected from the target community. Once the community can take advantage of the provided telecommunication access in accelerating local economic development, then maintenance and extension of USO facilities can be self-financed by the community itself.

3. POSSIBLE SOLUTIONS

3.1. POSSIBLE APPROACHES TO THE PROBLEM

USO implementation has not yet widely understood and practiced by ASEAN member states, especially in selecting an appropriate technology. Different approaches can be pursued to gain better understanding and successful implementation in this matter:

- A step-by-step approach focuses on USO implementation targets one at a time, then selecting one candidate technology for USO implementation in that area. This step is repeated until all areas have been processed.
- A generalized approach selects the most applicable technology for a country (selection could be based on a set of criteria), then adopt it for the whole country.
- A hybrid approach combines the specificity of the first approach and the speed of the second approach. A careful study and analysis is first conducted to assess possible technology options for USO implementation in various localities. Once a recommendation of available options and possible implementation strategy is devised, it can be applied in any area with characteristics covered in the scope of the study.

3.2. ADVANTAGES AND DISADVANTAGES OF PURSUING EACH OPTION

- The advantage of the first approach is that it can achieve high accuracy in selecting the best option for a specific area. However, it is too slow to eradicate digital divide in many of ASEAN countries. Furthermore, this narrow-focused approach is susceptible to slight variation.
- The second approach is simple and easy to implement, even in a broad region such as in ASEAN. However, it cannot ensure effective USO implementation due to its generic nature. The success of technology implementation highly depends on many aspects, which cannot be completely accommodated in a generalized approach.
- The third option aims at effective USO implementation through careful technology assessment. It may require overhead in the beginning (i.e., for study, evaluation, and assessment), but once this is done, it is generally applicable for various situations.

3.3. CONSEQUENCES OF DOING NOTHING

If nothing is done, USO implementation will not have a strong technological foundation. Technology selection will be arbitrary, or at least, not be based on a systematic mechanism. This could easily lead to low effectiveness and efficiency.

3.4. SELECTED STRATEGY AND WHY THE OPTION REGARDED AS THE BEST APPROACH

In addition to the advantages of the systematic technology assessment, the hybrid approach could be used to share experiences among ASEAN member states and for them to learn together. Project-wise, this approach could cut costs and increase efficiency, while at the same time promote the spirit of ASEAN networking.

4. OBJECTIVE AND SUCCESS CRITERIA

4.1. OBJECTIVE

The main objective of the project is to reinforce the AMC commitment to USO, in the context of current and future telecoms liberalisation, to promote a common understanding of its importance in extending the benefits of regional integration and to help identify some of the policy approaches and practices that may best support its realisation.

More specifically, the project aims to promote a common understanding among the AMC of the policy options open to them and the effects the policy mix adopted - in terms of service delivery / liberalisation, legal frameworks / regulation, responsible institutions, service range (voice telephony vs. data and the Internet, government on line, and other advanced communication and information services), technology options, financing models etc. – is likely to have on USO outcomes, based on experiences both inside and outside the ASEAN region.

Thereafter, the project aims to produce at a series of policy recommendations. These may be of a general nature, or in relation to tackling specific USO challenges vis-à-vis certain countries, areas, communities or sub-regions.

The overall objective of this technical assistance is assessment of technology option and technology mix for USO implementation in the ASEAN member states.

The specific objectives of the study are:

a) Selection of appropriate technologies for deploying telecommunication services (telephony, data and internet) in participating ASEAN member states and reasons for adopting such technologies.

b) Technical, administrative, and costs requirements for USO implementation in the ASEAN region.

c) A recommendation for hybrid/mixed interconnection architecture and technology and its implementation strategy, to be used as a guideline for ASEAN member states in implementing USO in their respective countries.

4.2. SUCCESS INDICATORS

Qualitative indicators for this project are as follows:

- Availability of appropriate technology options for USO implementation in different localities in the ASEAN member states
- Availability of realistic and practical guidelines for selecting appropriate technology options

4.3. SUCCESS MEASURES

A quantitative indicator for this project is a database of comprehensive information and documents related to various aspects of technology assessment conducted in this project:

- Technical and background information of various technology options
- Survey findings
- Analysis and assessment results
- Other references

5. OUTPUTS

The key results expected of the project are:

- the development of a USO background paper that a) highlights the key issues (with particular emphasis on technology choice and its impact in relation to identified delivery constraints, cost and service range), b) summarises the importance of USO / ICT dissemination in the context of regional integration, c) identifies research work already undertaken (both within ASEAN and outside it and d) highlights information gaps as may exist within the ASEAN region.
- the development of a guide to USO best practice / innovations (based on the above, plus data collected via a project questionnaire, for completion by the AMC and other key stakeholders, and presentations / discussions organised as part of a regional workshop geared to the sharing of relevant experiences and the identification of common concerns).
- based on the above the development of a detailed set of regional, national and sub-regional level USO policy recommendations.

The output of the project is a policy recommendation for ASEAN member states on the assessment of USO technology, including indications of its technical, administration, and financial applicability in ASEAN member states.

The project should produce the following outputs:

- a case study of USO program implementation in other countries.
- an on-line research, detailed study on Malaysia's and Indonesia's USO program implementation. Malaysia and Indonesia are taken as case studies due to their state of maturity in adopting the USO initiative and availability of telecommunication facilities.
- technology assessment for USO implementation in the ASEAN member states,
- Policy recommendation as a guideline for selecting and implementing appropriate technology

6. INDICATIVE WORK PLAN

The project will be conducted in 10 months and plan to begin at January 1, 2005. The project will work as planned below.

Table 5: Work Plan

No	Activity	Month									
		1	2	3	4	5	6	7	8	9	10
1	Project preparation										
2	Study of other countries USO program										
3	Investigate the Malaysia and Indonesia's USO program and, including site visit and in-depth interview using the questionnaires and interview guideline.										
4	Analysis of technical, administrative, and costs										
5	Technology assessment										
6	Regional workshop (bringing together AMC - (Tele-communications Ministries and telecoms regulators - telecoms suppliers, industry analysts and academic experts)										
7	Development of policy recommendations										
8	Report										

7. MANAGEMENT AND IMPLEMENTATION ARRANGEMENTS

7.1. MANAGEMENT ARRANGEMENTS

The project's sponsoring ASEAN Body is Working Group for Universal Access, Digital Divide and e-Government.

7.2. IMPLEMENTATION ARRANGEMENTS

The project will be implemented by the UA, DD and e-GOVT Working Group. The Executing Agency (EA) for the project will be the Directorate Telecommunication and Information, Dir. Gen. of Post and Telecommunication of the Government of Indonesia.

The EA will be responsible for setting up a task-force (TF) consisting of representatives from participating ASEAN member states who will serve as a counterpart for the EA team. Each member of the TF functions as an expert in the area of the study, or a contact person to relevant institutions in their respective countries. The EA will establish a project management will be responsible for organizing technical as well as administrative aspects of the TA.

1. The EA will conduct a comparative study of USO implementation program in non-ASEAN countries. The target countries will be selected from those which have similar characteristics to ASEAN countries. The study will be conducted on-site and through available documentations.
2. The EA will coordinate with the TF in conducting detailed study on telecommunication issues and USO implementation program, especially in Indonesia, Malaysia, and as case studies. Each member of the TF could either act as a resource person, or an anchorman to telecommunication institutions in the participating countries. The EA and the TF will meet regularly to coordinate the study, discuss the findings, and evaluate the results.

3. The EA will analyze the results of all studies and perform technology assessment for USO implementation in ASEAN member countries.

4. The results of technology assessment will be used to develop policy recommendation as a guideline for selecting and implementing appropriate technology. The recommendation will be discussed with the TF for verification on their applicability in each country, before brought up to the UA-DD-E-Govt Working Group for final approval.

7.3. MONITORING AND EVALUATION ARRANGEMENTS

Monitoring and evaluation is associated with each output of the study as mentioned in Section 5. The EA will report to the ASEAN Secretariat and the UA-DD-E-Govt Working Group.

The following table is the key issues related with the step by step of the proposed project.

Table 6: The Key Issues

Step of project	Key Issues	Method	Place	Funding source	Person in charge
Inception	Project method preparation	Presentation	Asean Secretary	project	▪ Sub Directorate of Special Telecommu-nication, Directorate General of Post and Telecommu-nication ▪ Directorate of Interna-tional Cooperation, Directorate General of Post and Telecommu-nication ▪ Asean Secretary
Interim	▪ Technical and background information of various technology options ▪ Survey findings ▪ Analysis of technical, administrative, costs, and assessment results ▪ Technology assessment	▪ Presentation ▪ Workshop	Asean Secretary Yogya-karta	Project and Asean Secretary	
Draft Final	Formulation of policy recommendation	Presentation	Asean Secretary	Project	