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Cooperation in Software Development within the ESCAP
Region - A Suggested Approach

Report from a UNIDO mission in April 16-28, 1989.

1. BACKGROUND

To explore the feasibility in organizing a structured co-operation for software development within the ESCAP region, visits were made to ESCAP in Bangkok and to UNDP in New Delhi where discussions were held. The view taken during these discussions was that such cooperation, due to national sovereignty and the advantage of flexibility, should preferably be discussed in terms of an organizational network rather than more conventional hierarctical organization.

Meetings with ESCAP took place on the 18th and 20th of April, with the Asian Insitute of Technology (AIT) in Bangkok on April 19. As a conclusion of the ESCAP meeting a joint report was issued on the 20th of April.

At the visit to UNDP/Dehli, meetings had been set up but unfortunately scheduled prior to my arrival in Delhi (probably misunderstanding from telex conversation between UNDP and UNIDO). Some of the meetings therefore were cancelled, some could be improvised. A new and important meeting was set up with CMC (Computer Maintenance Cooperation), a major Indian software house.

Based on input from the ESCAP and UNDP discussion as well as from other sources, e.g. the COGIT meeting in Vienna of December 1987 and other UNIDO reports on the subject, the following report is presented.

2. SUGGESTED APPROACH

2.1 Terminology

The following abbreviations are used throughout the report to characterize network nodes:

- RNP: Regional Nodal Point, i.e. an organizational body with coordinating responsibility within and of the network.
- CNP: Country Nodal Point, i.e. an organizational unit to serve as a country representation within the network.
- CSNP: Country Sub-Nodal Point, i.e. a firm, institution, etc in a country where software development takes place. A CSNP is typically a software house, a consultancy firm, a university department, a computer vendor etc. The CSNP:s are the primary users/suppliers of information that is disseminated through the network.

2.2 Why a Network?

A network as an organization model, has advantages in this context, over the more traditional hierarchical systems model where all members of the system strive for a unified goal. On the contrary, in the network, all nodes (CNP:s/CSNP:s) have the freedom to establish any internetwork contacts where their individual objectives can be met. The common goal is to facilitate communication between members.

A system model is furthermore characterised by its members, being easily recognized from non-members. In the network, however, members on the CSNP-level should have the freedom to utilize the network as desired.

It should be noted here that the term network primarily denotes an organization model rather than a computer network. It must, however, be implicitly assumed that an organizational network designed for the dissemination of information is an obvious prospect for an efficient computer network as well.

2.3 Network Implementation

It is obvious that a network like the one discussed, comprising the participation of initially 14 countries of the region (countries are identified in the report of April 20, see above), will not materialize in one step. On the contrary, it is a further advantage of the network model that given the conceptual structure, individual nodes may be added as appropriate. What is imperative, however, is that there is already at the start of activities a regional nodal point (RNP) identified for coordination.

3. REGIONAL NODAL POINT (RNP)

The RNP is a network node with the two objectives:

- to initiate network activities, with the support of UNIDO and ESCAP
- after the initial phase: to act as a network administrator, to monitor network activities and to explore business opportunities of benefit to network members

3.1 RNP Mission

The mission, initially, for the RNP should be, in cooperation with ESCAP and UNIDO, to

- identify CNP:s for participation in the network
- identify application areas with a demand for regional or local software development, either for local use or for export
- work out detailed objectives, procedures and development phases for the network
- identify CSNP:s where software development is already under way
- involve computer vendors in the network, as experts, as software suppliers and as potential buyers of adapted or locally developed software
- inform all relevant institutions, governments, firms etc about the network
- organize a workshop in the first or second quarter 1990 for a network kick-off, preferably in Singapore

3.2 A Suggested RNP

The Asian Institute of Technology, AIT, is here suggested as a suitable Regional Network Point. AIT is located just outside Bangkok.

3.2.1 About AIT

The Asian Institute of Technology is an autonomous international post-graduate technological institute. Established in 1959, the Institute was chartered in 1967 as an independent international and nonprofit making educational institution by special legislation of the Royal Thai Government.

AIT provides advanced education in engineering, science and allied fields through academic programs, leading to the award of Doctoral and Master's degrees and to Diplomas; research programs conducted by faculty and students or in cooperation with other institutions in Asia and abroad; and special programs aimed at professional development beyond the traditional period of formal education.

An international community of teaching faculty and research staff, representing some 25 nationalities, fosters the exchange and dissemination of advanced technological knowledge and expertise at the Institute.

Yearly AIT teaches about 650 students from 25 Asian countries and some from outside the region.

All but 3.5 per cent of AIT graduates have ignored the pull of the West and have stayed within Asea to become urgently needed technocrats. As of December 1987, AIT has produced 4,026 graduates from 33 countries.

3.2.2 Why AIT?

A number of reasons speak in favour of AIT as a setting for a RNP. Among the reasons are:

- AIT is already part of a network within the ESCAP region with contacts throughout
- AIT has a strong and positive image within as well as outside the region
- AIT provides today training within the undergraduate programme, in post-graduate studies and research as well as in the Continuous Education Center, aimed at vocational training and in the development and renewal of knowledge of engineers, scientists, managers, planners and other development agents in Asia
- AIT has already established contacts with ESCAP in Bangkok
- AIT has a very active software development in industrial application, e.g. CAD/CAM
- AIT has already organized work in separate centers, viz the Asian Information Center for Geotechnical Engineering (AGE), the International Ferrocement Information Center (FIC), the Regional Energy Resources Information Center (RERIC), and the Environmental Sanitation Information Center (EVSIC).

Of importance in this context is also the regional computer center (RCC).

Facilities at RCC include an IBM mainframe system 3083 with 16 megabytes of main memory, an IBM mainframe system 3031 with 6 megabytes of main memory which is dedicated for CAD/CAM applications, 22 GBytes of disk storage, 8 tape drives, one high speed line printer, one 3820 page printer, one 6670 information distributor (laser printer): over 70 terminals, 6 IBM 5080 CAD/CAM workstations, 2 communication controllers and other telecommunication equipment, such as microwave and modems, protocol converter, digital color plotters, digitizers, and several data preparation workstation. There are also 3 IBM 5560 personal computers with Korean, Japanese, classical and simplified Chinese keyboards; one with MicroCADAM.

Over 40 personal computers are housed in the RCC and many of these are also linked to the IBM 3083 mainframe, as well as to the RCC broadband local area network (LAN).

RCC has a wide range of software collection, including CAD&CAM for both mainframe and microcomputers. Compilers for almost all programming languages are available.

With RCC is furthermore the PCAD (Program in Computer Applications Development), a shortterm, hands-on, practical computer training intended for professionals. The instruction is based on the development of a real computer application related to the participant's work.

PCAD offerings are divided into three groups: one for specific subjects areas, another for tailored courses and the last for general requirements. Under special areas, PCAD offers courses in computer operations management, systems programming, CAD/CAM, data communications, and farm analysis package.

PCAD courses are conducted within the framework of the Regional Center.

Of interest in the context would be to explore the possibility to expand PCAD to a separate center as a RNP or a Regional software development center in the network.

3.3 Alternative to AIT

Among alternative to AIT as a regional nodal point are, for example, the Asian Electronics Union (AEU), India, or the software development center in Maccao, sponsored by UN University and the Portuguese Government. Probably also other alternatives could be found after some research.

Considering the two alternatives mentioned it seems that AEU may have some image problems although attempts are under way to improve this. The Maccao project seems to be focusing on training activities.

In comparison it therefore seems that AIT has advantages over the other alternatives, both in terms of its status within the region and in its present activities which are very relevant in this context.

3.4 Country Nodal Points (CNP)

At this stage only examples are given what would constitute suitable Country Nodal Points. Based on certain criterias such as an established organization, active and professional work in software development, a well established local contact network and international (regional) cooperation, suitable organization may be identified.

CMC of India might thus qualify as the Indian country modal point. In Sri Lanka, the University of Kelaniya has the potential of becoming the country's CNP. One of the first activities of the first project phase would be to identify CNP:s for the various countries in the region.

3.5 Country Sub-Nodal Points (CSNP)

A considerable number of enterprises in the region, from small consultancy firms to major government institutions and international computer vendors, are today involved in software development. An example:

Seagull Consultants in Goa, India, has developed own software for shipping administration and for local banks (financial transactions). The company is furthermore in the process of developing competence in CAD applications for small/medium shipsbuilding industry. Being a small company, Seagull has not got the financial strength, however, to market its services outside Goa. The network discussed here would therefore be an important channel for Seagull to communicate, within the region, information about software available to users as well as to other consultancy firms for joint activities.

The scenario of Seagull is obviously applicable to a great number of small to medium scale firms throughout the region.

3.6 Computer Network

As already pointed out, the word network at this stage refers primarily to an organizational structure. However, there are many advantages involved if information dissemination can be supported by a computer network. The following two comments may therefore be of relevance in this context.

1. There is already experience, within the region, in building national computer networks, for example at CMC in India. It should therefore be possible to draw on this experience in case a computer network is to be developed.
2. AIT is already linked to BITNET which enables a gateway to other global computer networks. This could be utilized if locally developed software is to be exposed to the international market.

4. PHASE ONE

The following activities are tentatively suggested to be carried out during a first phase of the project:

- * Initiate discussions with AIT (UNIDO)
- * Work out objectives and procedures for the network (UNIDO/ESCAP)
- * Initiate discussion with Potential CNP:s (country visits). (UNIDO/ESCAP)
- * Define evaluation criterias for successful project
- * Define a network strategy (UNIDO)
- * Plan for a workshop in first half of 1990 (UNIDO/ESCAP)

The first phase is terminated with a workshop in Singapore in the first half of 1990. The second phase that starts thereupon will be for two years after which the whole project will be reviewed.

5. COST ESTIMATE FOR PHASE ONE

1. Discussion with AIT (UNIDO)
 2. Country visits in the region
(Visits shared between ESCAP and UNIDO)
 - Costs for UNIDO: Air tickets, accomodation, allowances for one person, 10 days: 4.500 USD
 - Consultancy fee 10 days 3.000 USD
- Subtotal 7.500 USD

3.	Work out objectives, procedures, evaluation criterias, network strategy; documentation (5 days)	
-	Consultancy fee	1.500 USD
4.	Workshop preparation (5 days)	
-	Consultancy fee	1.500 USD
-	Administrative work UNIDO	
5.	Seminar Singapore 1Q/90	
-	Airtickets + accomodation + allowances, 2 persons, 5 days	7.500 USD
-	Consultancy fee (1 person)	<u>1.500 USD</u>
	Subtotal	9.000 USD
	Phase one: Total	19.500 USD

NB. Activities 3 and 4 as well as other project related activities might be carried out by an external consultant at the UNIDO office in Vienna during a month in the second half of 1989 or early 1990.

Transfer of CAD Technology to a Local Consulting Firm in
India - Assessment of Assistance Needs

Report from a UNIDO mission in April 21-24, 1989.

Objectives

To identify a small enterprise as the Indian counterpart to a Swedish software house, specialized in CAD software development for shipbuilding industry. To assess assistance needed to establish cooperation and to build up local CAD competence.

The report in structure as follows:

- * Background
- * Visit to Seagull Consultants, Goa
- * Visit to Seasafe Consultants, Stockholm
- * Remaining questions
- * Suggested approach
- * UNIDO input
- * Appendix:
 - Minutes of meeting with Economic Development Corporation of Goa
 - Notes of discussions with Seagull
 - Proposal for setting up computer facilities at Institute of Shipsbuilding Technology, Goa

Background

During a visit to Goa, India, in the period 21-24 April, discussions were held with Seagull Consultants Pvt. Ltd. Seagull is a computer consulting firm with a staff of six persons and specialised in local software development for business and industry. The company is well equipped with personal computer facilities. Software development is mainly UNIX-based.

Seagull is seeking contact with a Western counterpart to build an indigenous competence in CAD software development for shipbuilding industry, for small to medium shipyards, a fast developing industry sector on the Indian West coast (see attachment).

Preliminary interest to start discussions with Seagull has been shown by Seasafe Marine Software, a Swedish consultancy company that has developed its own CAD system for shipbuilding.

Seasafe has a very good international reputation for its software, designed for micro/minicomputers, and has an extensive reference list, not least in the Asian NIC-countries.

Visit to Seagull, Goa

From the discussions with Mr V.V. Sathe, MD of Seagull and from meetings with local shipyards, maritime organizations and local government, the following conclusions were made:

- There is a strong desire to have access to local CAD software competence in the region, partly as a result of growth in small/medium shipbuilding activities but also because of a move from the Bombay area to Goa of maritime institution such as international classification societies, naval architecture training etc (see attached).
- Local government in Goa is interested to take part in the actual project and is open to further proposals, also regarding financing (see attached).
- Seagull has good market connections with local business and industries, has a good standard of system software people, has adequate computer facilities and would be well suited to develop a CAD competence center for software development, customer service and training.

Visit to Seasafe, Stockholm

Mr B. Andersson, MD of Seasafe, is positive towards a joint Seasafe-Seagull project for the transfer of know-how regarding the actual CAD system. Mr Andersson sees the benefits of having local representation in India as a business opportunity. He also sees the benefit in transferring part of future software development to Seagull because of lower production costs. This locally developed software would then be sold on the international market.

Remaining questions

A basic question remaining to be solved before the project can reach an executable level:

1. Western software is priced at a level that is mostly too high for medium scale industries in India and other developing countries where hard currency is at scarcity. Western suppliers of software have, on the other hand, weak incentives to reduce price as long as there is a still high demand for software on the international marketplace.
2. How, then, to find a business solution that is attractive for all involved parties, i.e. Seagull, Seasafe and local customers/users?
3. The answer is probably, in this context, to find a solution where a reduced fee for utilizing Seasafe's software for demo and development/training purposes at Seagull's premises (i.e. the local CAD competence center) would be compensated by further software development undertaken by Seagull. As the CAD system, with or without Seagull-added software, is sold to local users, Seasafe receives a royalty from Seagull. An open issue is still what is the reduced fee and how it will be paid and by whom.

Suggested approach

Three initial activities:

1. Seagull and Seasafe meet to discuss terms and conditions, how to cooperate, time frame, costs and benefits, marketing, Seasafe support, royalties etc.
2. This meeting should preferably take place in Goa and be combined with joint Seagull-Seasafe customer visits in order to launch a project where already initially a customer is involved. From Seasafe Mr Andersson should participate. It would also be recommended that Mr P. Lind attend the discussions as a business consultant.
3. Make a project plan for two project phases and with areas of responsibility specified for the four parties involved, i.e.

- Seagull

- Seasafe

- UNIDO

- Economic Development Corporation of Goa (EDC)

UNIDO input

Phase one

- To cover cost for a meeting with Seasafe and Seagull, i.e. travel and accomodation for Mr Andersson and Mr Lind to visit Goa.

Phase two

- Purchase of CAD software from Seasafe for a reduced fee.
- To cover cost (together with EDC, Goa) for a specialist from Seasafe to install CAD system and train Seagull staff in CAD software (3 + 1 m/m).
- Support Seagull in establishing procedures for a demo center including a marketing campaign (1 m/m).
- After one year: Assess/evaluate results (1 m/m).
- Work out general conclusions and recommendations for similar transfer projects in other region.
- Report.

SEAGULL CONSULTANTS PVT. LTD.

ENGINEERING AND SOFTWARE CONSULTANTS

Notes on discussions with Mr. Par Lind.

Ref.: 011/23041
April 23, 1989

21st April 1989.

Mr. Lind gave information that UNIDO will be interested in promoting a joint venture between Seasafe and Seagull. He would be collecting details about feasibility of placing a Seasafe Software in a Goal Unit. He also wanted to gauge responses from the users like shipyards, if they would like local support.

He reiterated that Mr. Anderson of Seasafe is positively inclined towards a Unide sponsored joint venture. He would be interested in getting developments done in India as soon as opportunity arises.

Mr. Sathe briefed Mr. Lind about Indian Software scene, present status of Industry and local manpower costs.

22nd April 1989.

Seagull had arranged meetings with Mr. D. V. Salgaocar, Managing Director of Salgaocar group of Industries, Mr. Jayavant Chowgule, General Manager of Shipbuilding Division of Chowgule & Co. Ltd., Officials of Goa Shipyard Ltd. and Mr. Umaji Chowgule. The meetings were scheduled during 10 a.m. to 5.30 p.m.

The information relevant for the joint venture project is as follows.

1. Mr. Salgaocar informed that presently their shipyard is engaged in repairs and construction of Barges. They have no naval architect and while they have interest in ship design software, they are not ready for it.
2. Mr. Jayavant Chowgule informed that Chowgules have bought some modules from BTM (U.K.). While the modules are not comprehensive in coverage they were able to manage with the modules. The reports from the modules have to be processed on locally developed software.

He informed that the Shipbuilding Industry in Goa is on the lookout for a comprehensive software suitable for small vessels upto 3.0 m draft. The CEI and the local shipbuilding Industry have started an Institute of Shipbuilding Technology.

The Shipbuilding Society of Goa and this Institute intend to install a computerized training and service center (See Annexure D). Comprehensive ship designing software will be installed at the Institute for the benefit of local ship building Industry.

An officer from Mitsubishi is to visit the Institute for discussions on the subject. The discussion is for funding the

project under Japanese aid. 25% of the project cost will be financed by the Institute, Balance is expected to be covered under a bilateral aid package.

Mr. Chowgule informed that ABS has shifted their Indian main office from Bombay to Goa. Similar moves are expected from other classification societies active in India.

The training and service center will meet the requirements of small private shipbuilding yards as well as the classification societies.

3. Mr. Ryet, Joint Manager (designs) and the person in charge of VAX computer briefed us about position at the Goa Shipyard. This defense industry shipyard intends to buy a comprehensive software for their VAX machine. Presently they are operating an AUTOCAD software from Norway for structural design work and for producing paper tapes for NC machines for cutting steel plates.

Their inquiry (Annexure II) was sent to several companies around the world. Mr. Ryet informed that Seasafe have sent information about their package but have not sent a quotation. Only one quotation completely meeting their requirements was received. This quotation was from U.K. and was rather expensive.

Goa Shipyard Ltd. intend to buy software within their budget and if necessary in phased manner. They welcome an idea of having backup services in the town.

They intend to decide on source of software in the next three to four months.

A meeting with Economic Development Corporation of Goa has been scheduled on April 24th, 1989 11.00 a.m.

Summary of other discussions

Seagull is willing to participate in the joint venture. However the outline of the project is not clear to them. Following points need clarification -

1. What is nature of assignment from UNIDO? Mr. Lind's letter mentions a joint Seasafe Seagull project. Unido normally does not give assistance to private sector projects in India.
2. Joint venture software projects have worked well in India in the area outlined in stage three of Mr. Lind's letter. The success lies in using inexpensive Indian professionals for developing software. Ventures for promoting sales of foreign software have not fared well (primarily because of high cost of software). The project brief should contain a time frame.

Following points are favourable for the joint venture.

1. Goa is emerging as a center for small shipyards. The activity is also attracting classification societies. Instead of maintaining a representatives office, they are shifting their regional offices to Goa. Eventually some of these offices will have their own computers and will need software.

2. Goa shipyard Ltd. has a VAX machine and wants to buy software. Seasafe software can be sold if efforts are made and demo software is available with Seagull.

3. If grants from aid funds or UN organisations can be obtained, Seasafe software could be installed at the Institute of shipbuilding technology. This computer will serve as a training center and students will request for Seasafe software at their places of employment.

4. Software will be supported from Vasco da Gama, a harbour town, where headquarters of Goa Shipyard Ltd., Chowgules, Salgaocars and offices of classification societies are located.



24th April, 1989.

MINUTES OF THE MEETING HELD ON 24.4.1989
AT EDC OFFICE, PANAJI-GOA

The following persons were present:

1. Mr. Par Lind .. Business Development Partners of Scandinavia
2. Mr. V. V. Sathe .. Seagull Consultants
3. Dr. P. Deshpande .. EDC Ltd.
4. Mr. P. G. Prabhudesai .. EDC Ltd.

The meeting was to discuss the possibility of setting up Computer Aided Design Centre in Goa with the help of UNIDO assistance. Dr. Deshpande informed that the Govt. of Goa already has proposal to set up a Computer aided Design Centre in the Electronic City being set up in Goa. He also mentioned that the EDC is interested in having commercially viable unit and that it should be run on professional basis as a self supporting venture. The role of EDC and the Govt. of Goa should be preferably of catalytic nature rather than of providing continued support through out the life of the project.

However based on the present details available the EDC is unable to make any commitment since the full details of the project are not made available. The EDC is prepared to discuss this proposal further and would also welcome the involvement of private sector companies such as M/s. Seagull Consultants



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the EDC is looking forward to receive the full project proposal so that the role of EDC could be made very clear.

A handwritten signature in dark ink, appearing to read "P. G. Prabhudesai", is written over a faint, circular stamp or watermark.

(P. G. PRABHUDESAI)
CHIEF DEVELOPMENT OFFICER (PNP)

**PROPOSAL FOR SETTING UP COMPUTER FACILITIES
AT INSTITUTE OF SHIPBUILDING TECHNOLOGY, GOA**

.....

INTRODUCTION:

In India, Shipbuilding and Offshore activities are on a much greater scale in the West Coast, Goa is also no exception. But ironically, there was no such Institute to cater for their specialised requirements. That is why the Institute of Shipbuilding Technology, Goa, came up.

In shipbuilding and allied offshore activities, a digital computer can tremendously improve the overall efficiency by curtailing time, both in the design and fabrication processes. This Institute has to emerge much bigger to take the task of imparting technical development to the shipbuilding and affiliated industries in the West Coast and of the whole nation at large. In view of this, it is of utmost importance to get the students familiar with the modern methods and systems available with us. Keeping this in mind the need of a digital machine or in other words, a digital computer becomes the bare minimum for the Institute of Shipbuilding Technology. With a computer facility in the Institute and with the necessary theoretical background the students will be able to acquire a practical knowledge of using computers. Thus after passing out from this Institute they will be properly equipped with the agglomeration of the required conventional knowledge in shipbuilding engineering as well as the modern methods and techniques of digital computers. They will be better equipped to implement and to take charge of the modern methods and systems in shipyards and affiliated industries.

The computer facility at the Institute will establish a close relationship between the Institute and the shipyards and other organisations in Goa. There are about 40 small shipyards in this State and this facility at this Institute will be in a position to help them in a big way by providing valuable consultancy services in the field of ship design and manufacture or in solving any other technical problems.

Lastly the computer facility can be used by the highly qualified and experienced faculty members for various research and development work.

PROPOSAL:

We will like to set up computer centre with the following facilities to cater to the needs of students of this Institute and the Shipbuilding Industry:

<u>Details</u>	<u>Approx. Cost in Rs.</u>
a. <u>Hardware:</u>	
MINICOMPUTER	
- 80386 CPU (16/20 MHZ)	
- 80287 Coprocessor	
- 2 MB Memory	
- 1 x 5 $\frac{1}{4}$ " Floppy Drive (1-2 MB)	1,95,000.00
- 1 x 80 MB Winchester	
- High Resolution Colour Monitor with EGA	
- Ports - 2 x serial	
- 1 x parallel	
Unix operating system V	60,000.00
300 cps, Dot Matrix Printer	24,000.00
A1 size - Plotter	1,60,000.00
Cartridge Tape Drive 40 MB	22,000.00
18 x 12 Digitizer	29,000.00
4 x Serial Ports Card	7,500.00
PERSONAL COMPUTER (2 Units)-PC (Turbo)	
- 8088 I CPU (4.77/10 MHZ)	
- 640 KB Memory	
- 2 x 5 $\frac{1}{4}$ " Floppy Drive (360 KB)	68,000.00
- Monochrome Monitor	
- Ports: 1 x serial	
1 x parallel	
- Real Time Clock	

Details

Approx. Cost in
Rs.

b. Software:

Depending upon the need for the Diploma course in Shipbuilding Engineering and the requirements of the Industry, required software will be selected for which we intend to spend Rs.2.50 lakhs.

2,50,000.00

c) Infrastructural Facilities:

In order to create infrastructural facilities required.

1,00,000.00

TOTAL PROJECT COST:Rs. 9,15,500.00