Using Information Technology for Identity Preservation and Traceability to Transform the Marine Aquarium Trade - Philippines

The dot-ORG Digital Opportunity through Technology and Communication
Alliance for ICT Access and Applications
(dot-ORG) GDG-A-00-01-00014-00 ("Access Award")

FINAL REPORT

31 August 2006

Submitted to:

Christopher Light and Michael Tetelman
Academy for Educational Development
1825 Connecticut Avenue, NW, Wahington
DC 20009-5721
USA

Marine Aquarium Council

6F, Salustiana D. Ty Bldg
104 Paseo de Roxas
Makati City, Metro Manila, Philippines
Tel: +632 893-7252; +632 813-1308
Fax: +632 817-9541

923 Nu'uanu Avenue
Honolulu, HI 96817
USA
Tel: +1 808 550-8517 or 8217
Fax: +1 808 550-8317

Executive Summary

In April 2005, the Marine Aquarium Council (MAC) received an award of about USD 200,000 from the Academy for Educational Development (AED) based in Washington, DC, to implement a small project entitled "Using Information Technology for Identity Preservation and Traceability to Transform the Marine Aquarium Trade – Philippines". This activity was funded by the United States Agency for International Development (USAID) Asia Near East Bureau through the "dot-ORG Access" program implemented by AED. It was viewed as being complementary to a larger, ongoing project funded by USAID and managed by MAC, called "Transforming the Marine Aquarium Trade" (TMAT) in the Philippines.

Under this "Preservation and Traceability" project, MAC has created and undertaken pilot scale implementation of an integrated, real-time, web-based information technology (IT) system to enhance identity preservation and traceability capacity within the Philippines' marine aquarium trade. This system was established to extend from the individual fisher/collector level through to the exporter level in the Philippines, and to facilitate compliance to MAC Standards and Certification, which has "traceability" as an integral element.

In developing the "traceability IT system", MAC has worked extensively with users of the system. In addition to collectors of marine aquarium ornamentals, these include MAC Certified traders (who are domestic brokers / intermediaries) in seven municipalities (Provinces of Cebu, Bohol and Palawan) where MAC programs are ongoing, and two MAC Certified exporters. The participating traders and exporters now have skills to understand and use the system. MAC has provided them with hardware (in the form of computers, printers, personal digital assistants and other supply inputs), software, and training in the use and maintenance of the systems. MAC, in association with AED, has leveraged a unique public-private partnership to facilitate the design, development and adoption of this technology in the marine aquarium fishery. Among the principal partners is the Microsoft Corporation. Importantly, there has been a demonstration of the traceability IT system to a multi-stakeholder audience, which has resulted in significant acceptance of the technology at the local community level.

By tracking and monitoring the movement of the product, for example a commonly traded aquarium fish, value can be preserved through the chain to promote better return on investment for producers or harvesters, and at the same time promote environmental conservation.

For marine ornamental collectors and traders, the traceability IT system will:

- eliminate unreliable and burdensome paper-based requirements
- improve equity of income distribution by enabling coordinators to receive quicker feedback on shipment results and payment details
- calculate CPUE (catch per unit effort) per species to avoid over-harvesting
- enhance business processes
- strengthen presentation and marketing efforts to be in a better negotiating position in relation to exporters

For exporters, importers and retailers the system will:

- allow automation of their inventory capability and other core business functions
- better inform potential buyers of stock availability and organize shipments that require stocks from multiple sources

- reduce costs of, and time needed to collect, track and verify the data required
- streamline overall business processes
- encourage a “collect to order” ethos that will reduce stresses on reefs

While the traceability IT system and accompanying equipment have been readily accepted by users, there remain many challenges to promoting digital inclusion in the marine aquarium fishery. At the level of the trader and respective communities, there is a need for solid IT and communications infrastructure, reliable supply of electric power, access to supply inputs (and related financing), and regular computer refresher and skills upgrading. The momentum that has been established for the traceability IT system will need to be maintained. Moreover, the system will need to be extended to importers and retailers in market countries so that “end to end” transactional capability is established.

In following up the project, MAC is seeking to create a consortium-style partnership that will advance a commercialization pathway for the traceability IT system. A proposed consortium would include MAC, Reef Check, the Conservation and Community Investment Forum (CCIF), AED, Microsoft Corporation, key players in the global supply chain, specialized funding agencies, infrastructure and service providers. The project would be global in scale, but focus on the value chain between the principal source countries for marine ornamentals – the Philippines and Indonesia – and the market countries including USA, Canada, and selected European nations.

The main elements of a second phase would include:

- Research
- Capacity-building
- Software Applications Development
- Intellectual Property Protection
- Proof of Concept
- Marketing Communications and Outreach
- Microfinance

The traceability IT system is a model product that promises to serve both conservationist and commercial needs. It will be linked to rich databases that contain information on biodiversity, fisheries, coastal resource management and enterprise development that will be useful for international and national agencies, research institutions and local stakeholder groups. At the same time it will help to facilitate the flow of documentation that supports the conduct of the global marine aquarium trade, including but not limited to, compliance with MAC Standards and Certification.

The traceability IT system will have applications in other sectors that have a similarly structured global supply chain, such as forestry / timber, wildlife, and some resource-based commodities.

1. What has been achieved?

1.1 The Identity Preservation and Traceability Project has resulted in the development of a first level prototype of an integrated, real time, digital, monitoring, tracking and transactional information system for the marine aquarium trade that addresses both conservation and commercial needs. Figure 1 below identifies the hardware configuration and the range of users of the traceability IT system. Figure 2 provides an illustration of the system flow.

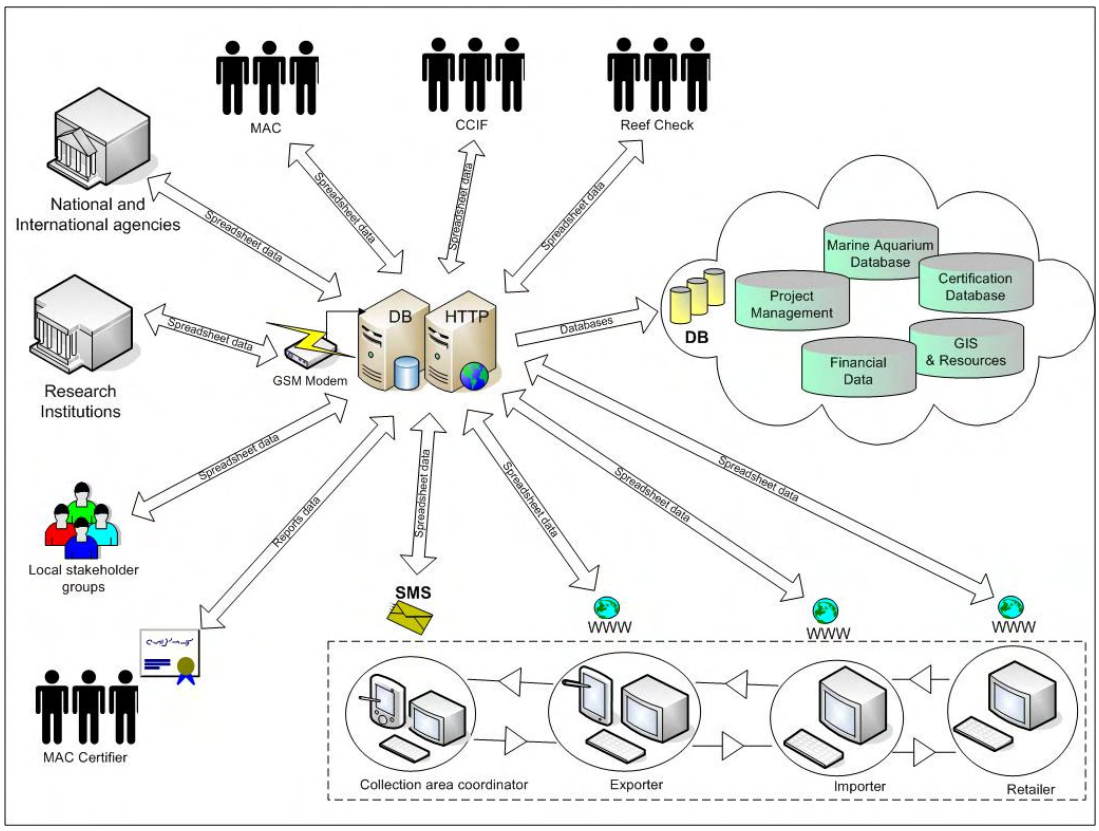

Figure 1 Hardware configuration of the Traceability IT System

Figure 2 System flow of the Traceability IT System

1.2 The system, referred to as the "traceability IT system" has been successfully demonstrated to a range of stakeholders in selected municipal areas of the Philippines (Cebu, Bohol and Palawan provinces).

1.3 Marine aquarium fish traders in seven coastal fishing communities, and representatives of two exporters have been trained in use of the system, including computers and personal digital assistants (PDAs) as it relates to document management and order processing.

1.4 Traders and their documentalist partners have been trained in basic computer operations, maintenance and data entry, as well as use of the PDA. The coordinator level training was equally distributed among men and women, while the exporter training was received by four women.

1.5 There is increased community awareness and local stakeholder "buy-in" of information technology applications as a useful tool in promoting better management of the marine aquarium fishery. A demonstration and media event in Cebu City on 29 May 2006 was given good coverage. In addition to the press articles listed in Appendix 2, the story was covered on prime time television news on 29 and 30 May 2006 on three televisions stations in the Visayas region.

Figure 3 Taking Ownership: Mayor Josephine Socorro Jumamoy of Inabanga, Bohol

1.6 The MAC Standards and Certification System, which has "traceability" inextricably linked within its fabric, has been reviewed with a view to refinements that will make the system easy to understand, clear, consistent, complete and transparent. This is the core business of MAC, so the contribution is of great significance as the requirements of the MAC Standards will guide the way the traceability IT system functions.

1.7 A form of public-private partnership has been established to implement this initiative. The participants have included:

a. Collector associations in project pilot areas
b. Local Government Units (LGUs) in project pilot areas
c. Cebu-Mactan Quality Marine Aquarium Fish, Inc, and Aquarium Habitat, Inc
d. United States Agency for International Development (USAID)
e. Academy for Educational Development (AED)
f. Soluziona, Inc (a software developer in Manila)
g. Microsoft Corporation
h. Marine Aquarium Council (MAC) with support from Reef Check and Conservation and Community Investment Forum (CCIF).

1.8 The partnership with Microsoft Corporation has permitted access to a generous software grant facility.

2. Why is identity preservation and traceability important in the marine aquarium trade?

2.1 The marine aquarium trade represents a complex, multilevel, global supply chain. In source countries such as the Philippines, the flow of "marine aquarium organisms" typically takes place as follows:

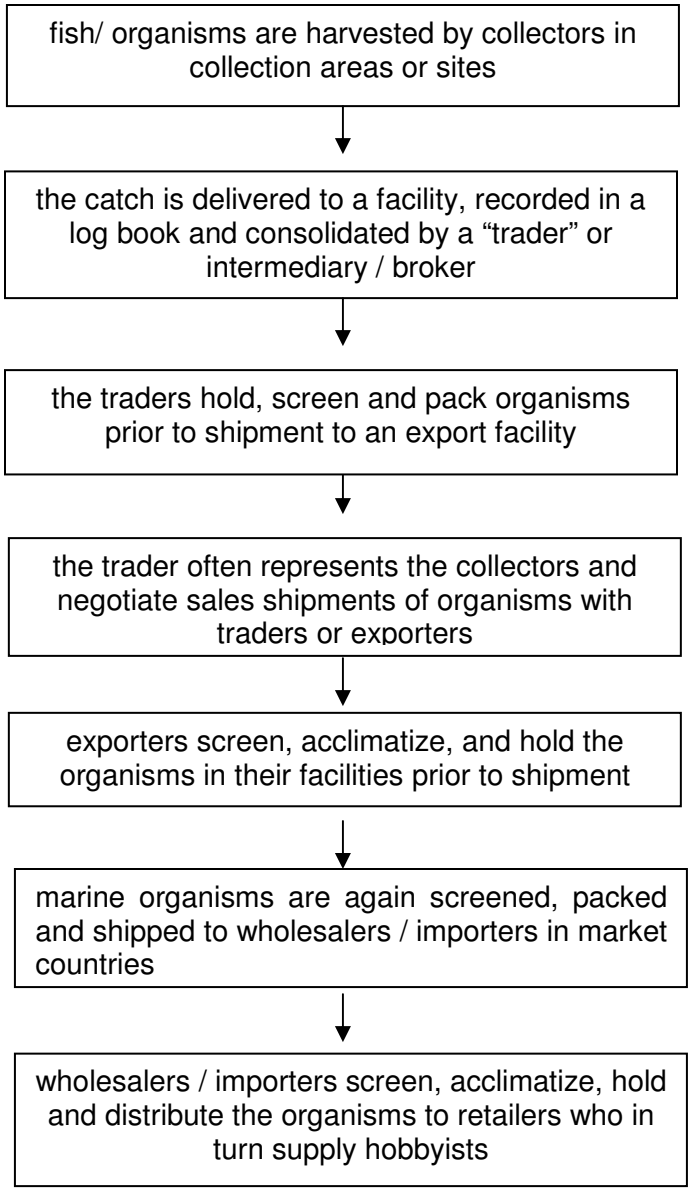

Figure 4 Diagram of the flow of the marine aquarium organisms

2.2 MAC programs in the Philippines build capacity to internalize good practices and standards at the level of the ecosystem, the collectors, traders and their communities, the exporter, the importer and the retailer to establish a closed loop or "Certified chain of custody". The Identity Preservation and Traceability

initiative provides one set of tools to help achieve and maintain MAC Standards and Certification.

2.3 "Identity preservation" refers to the value to track a particular product – whether a legally caught fish, a tree cut from an allowable area, or produce grown organically. By tracking and monitoring the movement of the product, value can be preserved through the chain to promote better return on investment for producers or harvesters, and at the same time promote environmental conservation. Identity preservation and traceability allows for the conduct of value chain analysis (VCA). Value chain analysis is a method for identifying and understanding the various activities within an organization that provide value to its products and the linkages among such activities. It is used to determine which aspects of an operation can be enhanced, where to reduce costs, optimize resource use, or even reconfigure the entire chain of operations for better performance. The end result of this effort is increased product or service value, lower costs of operation, or reduced costs to the public.

2.4 The value chain can be extended from all points where key activities take place – in this case from "reef to retail". A value chain analysis of the global marine aquarium trade, for example, would provide information on the relative economic contribution of a particular set of activities to a particular economic unit or community. The use of market-based instruments in promoting environmental conservation at the level of the marine aquarium fishery would help provide more qualitative and quantitative information which would be useful for the industry and governments alike.

2.5 Outlined in Table 1 below is one application of the traceability requirement for the MAC Ecosystem and Fisheries Management (EFM) and Collection, Fishing and Holding (CFH) Standards.

Table 1: Traceability: EFM and CFH Standards

Component	**Traceability: Segregation and traceability methods**
Intent	To ensure fish traded by certified collectors from a certified site is not co-mingled with fish from uncertified collections and/or collection areas and traceability of certified organisms are maintained through out the entire chain of custody
Requirements	1] Segregation system in place
Submittals	1] Catch records showing segregation 2] Shipment records showing segregation (packing list, organism receipt sheet)
Technologies	Packing list, Organism Receipt sheet (ORS), Physical design for segregation (use of jars, codes and other segregation containers

2.6 The information technology (IT) system developed through this partnership provides real time feedback and data analysis capabilities for key industry

stakeholders, as well as international, national and local conservation organizations. A requirement of the MAC Standards it to be able to "trace" the commercial path of a marine organism (i.e. fish or invertebrate) at each step in the value chain from collection to marketing at the consumer end of the chain. The IT System will permit the collection of data that will be useful to assist MAC, its partners and stakeholders to identify problems, understand root causes and strengthen management interventions at various stages in the value chain. The system also has transactional applications since it streamlines the documentation requirements for processing and assessing orders of aquarium fish.

3. What are the benefits of the traceability IT system?

3.1 The Preservation and Traceability System is presented in Figure 2 above. The figure shows the nature and flow of information and data between the various points in the value chain.

3.2 For marine ornamental collectors and traders, the system will:

a. eliminate unreliable and burdensome paper-based requirements
b. improve equity of income distribution by enabling coordinators to receive quicker feedback on shipment results and payment details
c. calculate CPUE (catch per unit effort) per species to avoid over-harvesting
d. enhance business processes
e. strengthen presentation and marketing efforts to be in a better negotiating position in relation to exporters

3.3 For exporters, importers and retailers the system will:

a. allow automation of their inventory capability and other core business functions
b. better inform potential buyers of stock availability and organize shipments that require stocks from multiple sources
c. reduce costs of, and time needed to collect, track and verify the data required
d. streamline overall business processes

4. How was the IT hardware and software received by the project beneficiaries?

4.1 The direct project beneficiaries would be the resource poor, marginalized marine aquarium fish collectors and traders that are part of the coastal communities where the program supported by MAC and its partners, Reef Check and CCIF, is implemented.

4.2 The local traders and their spouses are fully aware that the computer equipment will be helpful for their livelihoods. They have yet to grasp two things: a) how the costs from having this equipment should be incorporated in the costs of business and b) how to maximize the potential of IT to increase efficiency while doing business. More time should have been allocated to discuss this with them prior to

the training. This would include explanations of what the hardware, its uses, costs for maintenance, etc. This would have prepared them better for the training, particularly when discussing sustainability measures.

4.3 When the training commenced, the participants showed little resistance to learning about the new technology. This could be attributed to:

a. having husband and wife together to learn the basics of computer operations, as they often conduct day to day business in tandem. This represents part of the approach to foster gender equality

b. homogeneity among participants in terms of level of IT know-how

c. one-on-one coaching and tight mentoring by the MAC Area Managers who work with them on site, on a daily basis

d. highly skilled and dedicated training team, including the MAC IT Manager, MAC GIS and Multimedia Specialist and MAC Philippines Country Director

e. communications and instructional materials prepared in local dialects in easy to understand language, with illustrations

f. with respect to content, the topics covered were not overwhelming for first-time users of the computer. The teaching methodology was interactive and informal to permit easier adoption of the new information

5. Lessons Learned / Re-Affirmed

5.1 Software development requires continuous interaction between application developers and the end users in order to capture the precise nature of the functionalities required.

5.2 Applications development combines direct communications, iterations, testing, user validation, technical support and proper process documentation in order to be successful.

5.3 Project teams need to be flexible and roles and responsibilities overlapping to accommodate for turnover of personnel.

5.4 The approach must be market or demand-driven. In this case there must a perceived need by the industry for this type of product.

5.5 The product applications will need to be scaled up to include importers and retailers as users. (Now the system was tested by local traders and exporters, while the functions of importers and retailers were simulated.)

5.6 Given the low penetration of computers at the household level in the Philippines, digital inclusion is an initiative that needs to be undertaken incrementally with

careful consideration of the socio-economic and political realities of the particular context.

Figure 5 Maximiano and Celia Elle, traders living on Hambongan Island in Bohol prepare income statements using the computer

5.7 Regular exposure to computer operations and repetitive training will be required to strengthen the retention and learning capacity of local traders and their documentalists (often their spouse).

5.8 Counterpart contributions in the form of generators, automatic voltage regulators (AVRs), paper and other sundry inputs will be required on the part of the coordinators. This will depend on their own cash flow and related priorities, so there will need to be ways to address this.

5.9 Use of the computer had some immediate effects on the traders and their households, as well as the local fishing community. There is now something new in their lives that holds promise of enhancing their livelihoods, as this will serve as an important tool for advancing their business.

5.10 Solutions will need to be advanced for the lack of power and cell signal in remote areas, in this case, parts of northern Palawan, Philippines.

6. **The Way Forward: Digital Inclusion in the Marine Aquarium Fishery**

6.1 A follow up set of activities should focus on "productization" and commercialization of the traceability IT system. Useful elements of such an approach would include the following:

a. Research
b. Capacity-building
c. Software Applications Development

d. Intellectual Property Protection
e. Proof of Concept
f. Marketing Communications and Outreach
g. Microfinance

Research

6.2 The information at the "back-end" of the servers needs to be strengthened, verified, consolidated and updated on regular basis, as this will form the basis for the collect-to-order system and facilitate transactions. More research needs to be conducted in the following areas:

a. further refinement of the existing marine organism database (MOID)
b. further refinement of the data gathering, flow and input for the MAQTRAC surveys and subsequent establishment of total allowable catch (TAC) figures
c. refinement of Master Lists of available species from particular areas
d. refinement and updating of market and price-related information
e. additional software applications development (expanded below)

6.3 Work on the "front end" or user interface would involve establishing a seamless integration with all the corporate and industry report and document formats, as well as facilitating web-based access to a wealth of scientific and trade information.

Capacity-building

6.4 As an extension of this initiative, MAC will continue to provide technical IT support to the participating coordinators and exporters.

6.5 For a second phase there will be a need for more systematic continuing education and training, to upgrade local skills. Two key areas will include:

a. developing local scientific knowledge, among other things, to be able to conduct the MAQTRAC surveys and other types of resource assessment
b. upgrading local skills in use of information technology tools and methods

Software Application Development

6.5 MAC will continue to resolve existing application weakness in the system, which include:

Personal Digital Assistant (PDA)

a. The SMS capability is not stable (intermittent when receiving orders sometimes not receiving a report)
b. The organism price was not captured in the PDA from the collector
c. Only 1 common name attached per organism
d. Need more functionality in the PDA inquiry (Total catch summary, Packing list, ORS, etc)

e. The PDA should capture also the delivery for non certified exporters/buyers
f. Loading of organism pictures are slow for a huge number of organism the PDA will freeze during loading
g. Pictures used for buttons in the PDA are not presentable for the system

Web application

h. Lack of reporting modules in the Exporter, Retailer and Importer level.
i. Presentation of the application in website needs enhancement especially in the ordering. Enhance with regards to user friendly version.
j. There is no search functions for organism.
k. No sharing of organism stock available for exporters, retailer and importer level

6.6 Based on consultations with exporters and coordinators, the following software enhancements have been identified for a subsequent phase:

PDA (local trader level)

a. Enhance the SMS receiving for orders and ORS
b. Screening logbook and ORS should capture the details in PDA
c. Enhancement of data/pictures loading in PDA
d. The PDA should record the organism prices from collection to Exporter
e. Enhance the PDA back-up utility to the collectors' computer, in order to record and view the detailed ORS, Packing list, Income reports, Collectors logbook, and Total Catch
f. The coordinator should have the capability to analyze their data in the computer desktop using a database
g. The coordinator should have the capability to generate various reports
h. Maximize the performance of the coordinators computer, develop a system that will capture the data from the collection sites

Web application (for Exporter, Retailer, Importer)

i. The entities should have the capabilities to generate various reports such as Income Reports, Official Receipt Sheets (ORS), Supply Shipment Reports (SSR), stock listing and other related reports
j. Add data sharing functionality for example, organism stock list for exporter, retailer and importer
k. Share information between entities like, what are the top organism in the market
l. Create a website/section that will share to the public, investor, partners that will show the status of the marine trade (top organism in the market, mortality report, top reason of rejects, top buyer/market in the marine trade, highest catch organism, or any trends/graphs that can generated by the NEMO database)
m. Reports on MAC Certified organisms

Intellectual Property Protection

6.7 Ownership of the system will need to be established. To date, MAC is in possession of the source codes. Any further development work will need to consider:

a. due diligence with respect to existing products and services
b. filings for appropriate intellectual property protection, particularly copyright, trade and service marks (and maintenance of such)

Proof of Concept

6.8 MAC will continue some additional work to include selected retailers, importers and wholesalers into the system, however due to funding constraints, this will be limited (until additional funding can be secured). Currently there are participating coordinators and exporters, but the importer and retailer transactions have been simulated. MAC and its partners are in the process of creating dedicated supply chain flows of MAC Certified products between traders, exporters, importers and retailers in the Philippines, Indonesia, USA and Europe (with possible transshipment through Singapore). For example, from Camotes Island, Philippines to Cebu-Mactan Quality Marine Aquarium Fish in Cebu, Philippines, to Quality Marine in Los Angeles, USA to several MAC Certified retail outlets in the USA. These supply chains will serve as the "proof of concept", which will need to be implemented through an iterative process, and documented carefully.

6.9 A second phase will scale up the traceability IT system and promote regular "end to end" transactions, among other things. The aim is to ensure a robust, working system, *"from Reef to Retail…."*

Marketing Communications and Outreach

6.10 It will be important to create an awareness and understanding of:

a. issues related to adoption of information technology in marginalized, resource poor coastal communities
b. applications of the traceability system to global efforts to promote market-based instruments in biodiversity conservation
c. create a stronger "pull through" effect in terms of demand for MAC Certified products

6.11 Communications tools and methods will need to be developed and applied. These would include:

a. training and demonstration videos to accelerate learning and retention
b. documentaries for purposes of information, education and outreach to targeted communities
c. multimedia products and services that may help develop a revenue stream for MAC

Microfinance

6.12 MAC and its partners have already established working linkages with selected microfinance institutions (MFIs) in the Philippines and Indonesia. MFIs are slowly beginning to recognize "marine aquarium fish collector" as a viable occupational category, whereas previously this was not the case. Considerable training in business management has been done with the collector communities, which has served to dispel any misunderstanding about mutual obligations with respect to small scale loans. For a follow up phase, microfinance would be required on two levels:

a. to finance the fishing and holding facilities (eg boats, nets, jars, other supplies and equipment) and extension activities of coordinators (eg holding and transport facilities) to improve quality of the organisms
b. to finance the acquisition of equipment (more computers, accessories, software and peripherals) additional supplies (eg communications loads, paper, ink, generators, etc) specifically for the traceability IT system

6.10 It is envisioned that funds may be accessed from an international donor and using MAC and CCIF as a conduit, be provided to locally-based MFIs using an "on-lending" model.

Potential for a Consortium-Style Approach

6.11 An appropriate model for moving this initiative forward would be a loose consortium of key actors that would be able to implement a functional, commercially-driven information system. Initial steps have been taken to package such a consortium, as outlined in Table 2 below:

Table 2: Possible partnership configuration for a subsequent phase

Partner	Potential Role	Status
Marine Aquarium Council	Standards setting and accreditation body to lead the facilitation of the project	Committed with some match funding available
Conservation and Community Investment Forum (CCIF)	Facilitate Microfinancing model – possible "on-lending" from international sources to locally-based MFIs	Committed with some match funding available
Reef Check	Assistance with scientific information, development of marine organism databases and	Committed with some match funding available

	allowable catch levels	
Academy for Educational Development (AED)	Facilitator, leveraging partner	Support in principle, with hope of leveraging of additional funds from USAID and other sources
Microsoft Corporation (Singapore)	Leveraging partner	Committed to provide software grants on a reasonably large scale
Research funding agency	Funding of research, capacity-building and some trade facilitation	Approached a Canadian donor agency, which expressed willingness to receive a concept for internal review leading to full proposal. Others being explored.
Telecommunications companies	Provider of communications infrastructure (ie cell sites) and facilitation of streaming text capability to facilitate order processing at the level of the reef.	Considering local and regional providers - Smart Communications (Philippines) or possibly the Bridge Alliance (Singapore Telecom, Globe Telecom, Tekcomsel Indonesia)
Global supply chain companies	Logistics and supply chain management solutions	One global company has agreed to consider. Presentation planned for second week of September 2006. Other options being explored
Selected Exporters in the Philippines (and possibly Indonesia	Industry practitioners	Two companies committed, others considering depending on opportunity
Selected Importers and Retailers in USA and Europe	Industry practitioners	Yet to approach
Selected Exporter and Transhipper in Singapore	Industry practitioners	Discussed concept and agreed to continue to communicate
IT training institutions	Ongoing training of and technical support for collector communities as part of digital inclusion	Considering two leading institutions in Philippines and Indonesia. One institute in the Philippines has been approached and expressed interest

Appendix 1: <u>Chronological Summary of Activities</u>

July 1 to August 15, 2005

- Developed project work plan (including monitoring and evaluation framework, cost share strategies)
- Formed a project team from among appropriate MAC staff to fully develop the project
  - Peter Scott - Technical and Project Leader
  - Arun Abraham – Legal, Administration and Financial
  - Michael Ocana – Project Technical Specialist
  - Ronet Santos – MAC Philippines Country Director
  - Isabelle Cruz – MAC Compliance Monitoring Specialist
- Developed Time and Effort and Accounting Regime
- Project Kick-off meeting was held between Soluziona and MAC
- Developed a Project monitoring and evaluation framework

August 16 to September 15, 2005

- Produced contract and purchase specification and hire subcontractor to develop related applications, procure equipment and to carry out training of end-users.
- The M&E Plan Rev 1 was produced and sent to AED for their comment.
- Business process mapping.
  The first business profiling session was held on the 18th August 2005. This was followed with on site interviews in Camotes, Batasan and Clarin and with Exporters in Manila and Cebu as follows.
  Interviews with traders
  - August 26 : Epefanio Saavedra (Batasan)
  - August 26 : Pablo Escabas Jr. (Clarin)
  - August 27 : Teofisto Soringa Sr. (Camotes)

  Interviews with Exporters
  - August 25 : CMQMAF (Ms. Sheila Boserio)
  - September 6 : Marine World (Mr. Louie Dimayuga)
- Interviews with Mr. Benjamin Villamor of Globe Telecom in Cebu office

September 16 to October 15, 2005

- Series of meetings was held between MAC and Soluziona
- <u>Software Development</u>
  During this period the following design and development work was undertaken by Soluziona:
  - Validated process design
  - Developed preliminary design of web application screens
  - Developed preliminary data model

October 16 to November 15, 2005

- Series of meetings was held between MAC and Soluziona
- The Project Committee finally decided upon IBM as the preferred server manufacturer
- It was decided to house the servers for the project within the offices of MAC in Makati, Manila
- <u>Software Development</u>
  During this period the following design and development work was undertaken by Soluziona:

Presentation of Project to USAID Evaluation Team
Functional Design submitted to MAC for review and approval
Validated functional design with MAC (Revisions required)

- Developed System Administration
- User maintenance
- Species maintenance
- Area/Site maintenance

November 16 to January 15, 2006

- Series of meetings was held between MAC and Soluziona
- An HTTP SMS Gateway software has been evaluated by Soluziona along with a Nokia GSM Modem for the server.
- <u>Software Development</u>
  - November 30: Functional Design (2nd draft) submitted to MAC for review and approval
  - December 6: SZ validated functional design (2nd draft) with MAC Revisions required
  - Soluziona developed the following functions :
    1. TAC maintenance
    2. Entity maintenance (i.e., Exporters and Importers)
    3. Order Creation/Allocation
  - December 19: Functional Design (3rd draft) submitted for approval
  - January 6: SZ validated functional design (3rd draft) with MAC Revisions required
  - January 10: SZ submitted revised Functional Design (4th draft)
  - Soluziona finalized hardware and software estimates
  - Soluziona developed the following functions :
    1. Organism Receipt (for Exporters and Importers)
    2. Org. Dispatch (for Exporters and Importers)
- Retailers have also been added to the web-based program as these are basically a copy of the Importers.
- Actual development time has exceeded schedule

  Development time has been extended due to the departure of a developer at Soluziona. They are searching for a replacement to get development back on track and mitigate the delay caused by the departure.

January 16 to April 15, 2006

- Series of meetings was held between MAC and Soluziona
- IBM Xseries servers was installed in MAC's office
- Ozeki SMS Gateway was purchased via internet.
- Rack cabinet for servers was installed in MAC's office
- 6 SmartPhone for 4 traders was delivered in MAC's office.
- 4 Conventional PDA was delivered in MAC's office.
- GSM Modem was installed in MAC's office.
- 3Com Switch and KVM was installed in the servers.
- Project background presentation with Christopher Light (AED)
- Software Development
  - January 25: Functional Design (version 5) submitted for approval
  - January 26: Approval of Tracking Nemo functional design

    - Series of debugging and testing of web application
- Visit with Cebu Exporter(CMQMAF) and Trader (Camotes) with Soluziona and Christopher Light.
- Soluziona present the web application to Christopher Light
- Technical and Project Leader leaves MAC (March 2006)
- New Project Leader meets Microsoft to discuss software grant/discount and other issues related to communications

April 16 to June 15, 2006

- Series of meetings was held between MAC and Soluziona
- Series of debugging and testing of web and PDA application was taken by Soluziona and MAC.
- APC Back-UPS for server's was installed in MAC's office.
- MAC developed a web application template for Traceability IT System web application
- MAC trained Cebu trader for the preparation of Media event.
- MAC trained Cebu exporter (CMQMAF) for the preparation of Media event.
- Demonstration event was organized in Cebu, Philippines with wide stakeholder participation
- Software Development
    - Blanket Ordering Processing
    - Sending of SSP and Rejects via SMS from Web application to PDA.
    - Mortality report
    - Stock Monitoring Report
    - Inquiries on Customer orders.
    - Staff training reports
    - System administration under Coordinators PDA.
- Microsoft software provided through the grant arrived to MAC and installed on the servers

June 16 to August 31, 2006

- Series of meetings was held between MAC and Soluziona
- Series of debugging and testing of web and PDA application was taken by Soluziona and MAC.
- MAC presents a web and PDA application enhancement to Soluziona for scoping.
- Software Development
    - Under exporters PDA
        - Customer Order processing
        - Organisms Receipt
        - Stock Monitoring
        - System administration
- Printing and web application enhancements was quoted by Soluziona under the out-of-scope activities, proper cost estimate and timeframe was submitted to MAC.
- Additional 5 SmartPhone was purchased for the expansion collection sites:
    - Palawan
        - Marcilla
        - Tara
        - Busuanga
        - New Busuanga

- 9 Sets of IBM ThinkCentre Desktop Computer and Epson Dot Matrix computer was purchased for the 9 collection sites :
    - Palawan
        - Marcilla
        - Tara
        - Busuanga
        - New Busuanga
    - Cebu
        - Camotes
    - Bohol
        - Batasan
        - Tangaran
        - Hambongan 1
        - Hambongan 2
- Microsoft software was obtained under a special grant facility (valued at USD 32,000)
- Various other software was purchased :
    - Adobe Photoshop for image editing
    - Adobe Illustrator for image editing
    - Macromedia Director for web application editing
- 3 laptops were purchased for use by senior MAC officers in market countries
- Training of trainors was conducted by Soluziona in MAC's office, participants are :
    - MAC Philippines Country Director (Felipe Ramiro)
    - MAC Area Manager, Palawan (Dante Dalabajan)
    - MAC Area Manager, Cebu-Bohol (Josephine Savaris)
    - MAC IT Manager (Michael Ocana)
    - MAC GIS and Multimedia Specialist (Marissa Pandoro)
- Training of traders from Palawan and Cebu-Bohol was successfully conducted in Ateneo School in Makati, participants are :
    - Palawan
        - Marcilla - Venerando Eliseo Jr and recorder
        - Tara - Relly Bernal and Community organizer
        - Busuanga - Floresto Macmac and recorder
        - New Busuanga - Melchor Layson and recorder
    - Cebu
        - Camotes - Teofisto Soringa Sr. and recorder
    - Bohol
        - Hambongan 1 - Maximiano Elle and recorder
        - Hambongan 2 - Eddie Lariosa and recorder
        - Batasan - Epifanio Saavedra and recorder
        - Tangaran - Pablo Escabas Jr. and recorder
- MAC technical specialist installed the computers to all the collection sites and conduct a one-on-one advanced training on computer operation.
- MAC technical specialist trained 2 exporters for the web order application
        - CMQMAF for the Cebu-Bohol area
        - Aqua Habitat for the Palawan area
- The pre-implementation of the traceability IT system was not successfully tested on site because of the technical problems encountered in all the SmartPhones.
- The 9 unit SmartPhones were re-called for troubleshooting and updates.
- Software required for the server was installed by Soluzion in the MAC's server.

- Exporter's final application for the PDA was delivered and for validation.
- User Acceptance Testing (UAT) was pending, deliverables by Soluziona for validation.
- Traders' PDA technical problem was fixed by Soluziona.

Appendix 2: List of Press Releases from the Demonstration / Media Event

Multi-Stakeholder cooperation bridges digital divide in Marine Aquarium Fishery.Sun Star Cebu, page B4.June 8, 2006.

Hi-tech system for fishers mulled by foreign groups.Visayas News bits, Manila Bulletin, page N3.June 4, 2006.

Jumamoy Oks digital device.Bohol Sunday post, page B-8B.June 4, 2006.

Microsoft Software.News Briefs,Business World, page S1/11.June 1, 2006.

Groups to help market aquarium fish globally.Sunstar,page A17.May 30, 2006.

Napoles, Noreen.Digital traceability project seen to safeguard aquatic resources. The Freeman, page 6.May 30, 2006.

Sino Cruz, Irene R.Program to raise earnings of aquarium fish collectors.Cebu Daily News, page 25. May 30, 2006.