A
BUSINESS PROPOSAL
ON
EMV-COMPLIANT CARD ISSUANCE SOLUTION

for the consideration of

Attn: Mr. Abdullayev Sanzhar
Chief Card's and E-Services Officer
ABA Bank

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Submitted by

"YOUR TRUSTED PARTNER
IN
BUSINESS-BUILDING TOOLS"

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1

INTRODUCTION

"YOUR TRUSTED PARTNER
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1.1 <u>INTRODUCTION</u>

We would like to thank ABA Bank for the opportunity to submit this proposal for an EMV Compliant Smart Card Issuance Solution to be integrated into Bank's current smart card emboss machine system.

The purpose of this document is to define and convey the concept of EMV Smart Card Personalization Solution to issue personalized and certified UnionPay International (UPI) EMV banking cards for ABA BANK, as well as Visa, MasterCard and other Payment Schemes banking cards in the future. This document contains the details of the proposed architecture, the software and additional hardware components as well as the commercial offer.

It should be noted that the proposed system configuration is based on limited knowledge provided by ABA BANK to Hengbao International (HBI) at the point of preparing this proposal. I would like to suggest that after review of this document and if ABA BANK would like to pursue the matter further, HBI technical team will make an on-site bank visit to confirm the current system set-up in ABA BANK's card personalization center, which will enable us make any further technical or commercial revisions if necessary.

We believe that our offer is a very competitive package in terms of pricing, professional services and project management for the EMV Compliant Smart Card Issuance Solution. Furthermore, we are pleased to provide a complimentary one full-day EMV Technical Workshop at your premise at no additional cost to the Bank.

Once again, we thank you for this opportunity to be of service to ABA BANK and we look forward to working with you in the near future.

Best Regards,

David Tang

Business Development Director
Financial Cards & Payment System
5st June 2014

1.2 <u>EXECUTIVE SUMMARY</u>

ABA BANK currently has a smart card personalization system* that will be used for EMV banking card personalization.

HBI proposes a an EMV Compliant Smart Card Issuance Solution to enable the use of the card personalization system to personalize UPI banking cards, as well as make provisions for subsequent use of the system to personalize Visa, MasterCard and other Payment Scheme EMV cards in the near future.

1.3 <u>SCOPE OF PROPOSAL</u>

Based on the understanding of ABA BANK's business needs as stated earlier, the document details out the scope of works, consultancy services and list the options available as well as HBI's commercial offer in order to implement this project.

The proposal is divided into several sections: -

Section 2   **Proposed EMV-Compliant Card Issuance System**

In this section, a Card Issuance System has been proposed; a system based on integration of PersoMaster and DataCard 280P Desktop embossing machine.

Section 3   **EMV Project Management and Professional Service**

In this section, the project implementation plan is briefly described. This will cover the whole area of implementation plan including the installation of EMV infrastructure, system component, target hardware and the issuing of EMV test card.

Section 4   **Card Issuance Solution Commercial Offer**

In this section, we describe the EMV Card Issuance Solution's commercial offer for all the options with the terms and conditions.

- Remarks: HBI has made the following assumption: Personalization Machine is a DataCard Model 280P and the hardware has the following modules: Chip Encoder (single head) / Indent Printer / Emboss Printer / Thermal Printer / Magnetic Stripe Encoder.

SECTION

2

EMV-COMPLIANT CARD ISSUANCE SOLUTION

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2.1 SYSTEM DESCRIPTION

In this section, HBI provides a solution for ABA BANK to issue an EMV cards using EMV-Compliant Card Issuance System.   The proposed system requires an integration of PersoMaster System and DataCard 280P machine control software.

PersoMaster is divided into three software modules; Data Preparation, Key Master/ Key Partner and Card Issue. The Data Preparation Module is used to process the embossing data provided by Issuer CMS and produce an EMV data. During data preparation process, the keys and certificates will be calculated by the system. This requires utilization of SafeNet's Hardware Security Module (HSM). In the next process, the chip personalization process is performed by Card Issue module. Once again the HSM will be accessed by the system in order to inject the RSA, Triple DES Keys and Certificates inside the chip.

Lastly the DataCard 280P machine control software is used to control the machine parameter setting and emboss the cards.

2.2 SYSTEM ARCHITECTURE
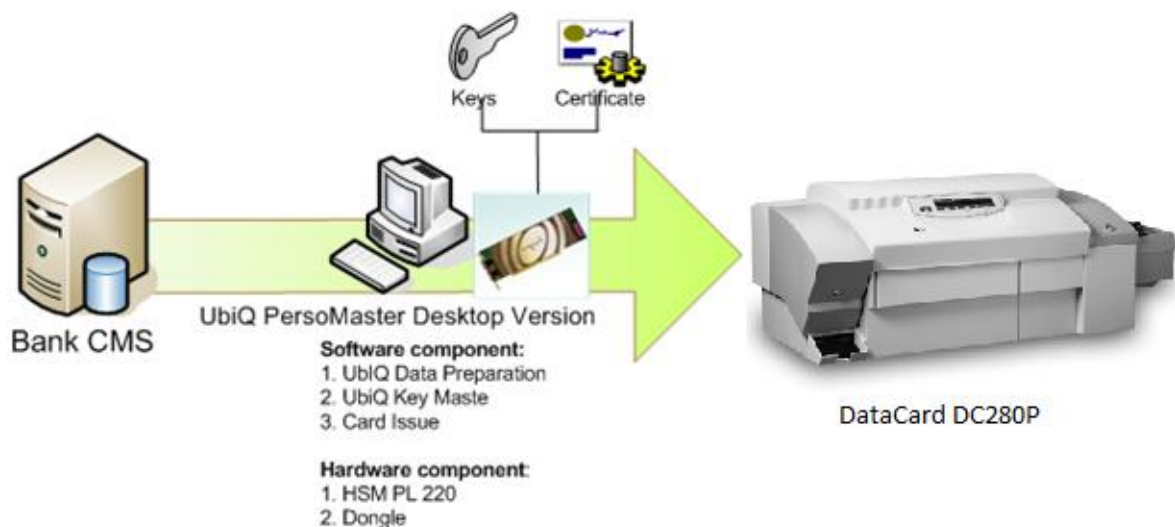
2.3 PROPOSED SOFTWARE COMPONENT

The proposed software component to issue an EMV card will be as follow:

a) PersoMaster EMV Personalization Software

- Data Preparation Module
- Key Master/ Key Partner Module
- Card Issue Module

2.3.1 PERSO MASTER SOFTWARE

PersoMaster is a suite of smart card personalization software applications that significantly simplifies the process of personalizing single and multiple application smart cards. It takes a "lifecycle" approach to personalizing cards, which includes:

a) Planning, selecting and validating card program components.
b) Preparing data and generating security keys prior to production personalization.
c) Producing cards in a time-sensitive and secure environment.
d) Enables to design a complete issuing system using components that meet issuer specific requirements.
e) Future smart card programs can be supported with minimal modifications.
f) A single personalization system provides foundation to meet the needs of all current and future smart card programs.
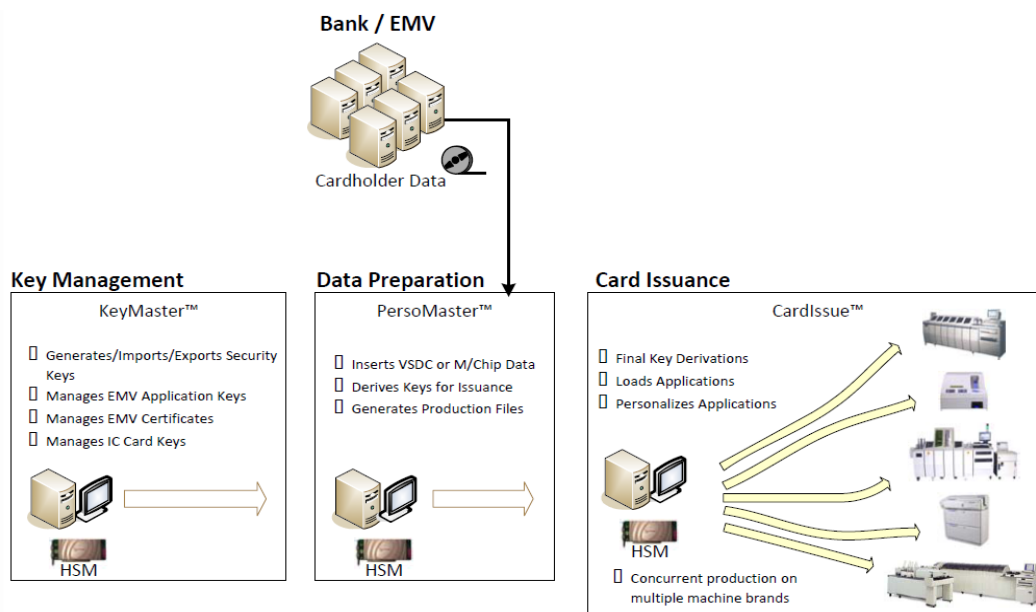
PersoMaster suite provides the solution to plan and implement each stage of the card personalization lifecycle and minimizes the risk of costly errors. It includes three application modules:

- **Data Preparation^{TM} Module:** Provides personalization process tools to manage the preparation of the data and generation of security keys prior to production personalization.

- **Key Master^{TM}/ Key Partner^{TM} Module:** A universal key management system that can be configured support any card configuration designed the Card Plan^{TM} module.

- **Card Issue^{TM} Module:** A highly flexible personalization application that can support numerous smart card programs without requiring the issuer to write customized software. In addition, it includes the ability to interface with libraries of personalization devices, HSM and chip operating systems.

2.3.1.1 DATA PREPARATION MODULE

Data Preparation module offers a solution for the next generation of smart card data preparation requirements. The production of smart cards in a multi-application and multi-platform environment which requires software to combine a variety of input components to produce complex production data records, required to issue large volumes of smart cards daily. These data records contain text data, graphics data, and magnetic encoding data as well as personalized smart card application data that includes coded parameters and encrypted keys to be programmed into the smart chip. The standard emboss data file typically comes from a host system, and is combined with smart card data (i.e. EMV) to produce this production data output.

Data Preparation module is world leading smart cards data preparation software capable of processing multiple files in parallel. These files can include a wide variety of EMV (e.g VSDC, M/Chip or CUP) and other applications for various card platforms. To achieve maximum performance multiple HSM's can be supported simultaneously. Data Preparation module can accommodate many different file formats and standards from many different CMS's and SCM's. These include CMS, SCMS and other proprietary system which are integrated into our data preparation system.

2.3.1.2 KEY MASTER / KEY PARTNER MODULE

Key Master/ Key Partner module is a universal key management application designed so that it can be configured to support most smart card application through key profiles. The primary functions are to create, import /export, transfer, store and protect cryptographic keys and certificates. It supports issuer public key certificates for Visa, MasterCard and UnionPay International. Key Master/ Key Partner utilize a HSM for the performance of a spectrum of symmetric and asymmetric cryptographic operations, as well as a securing the key vault repository for keys, certificates and other sensitive information.
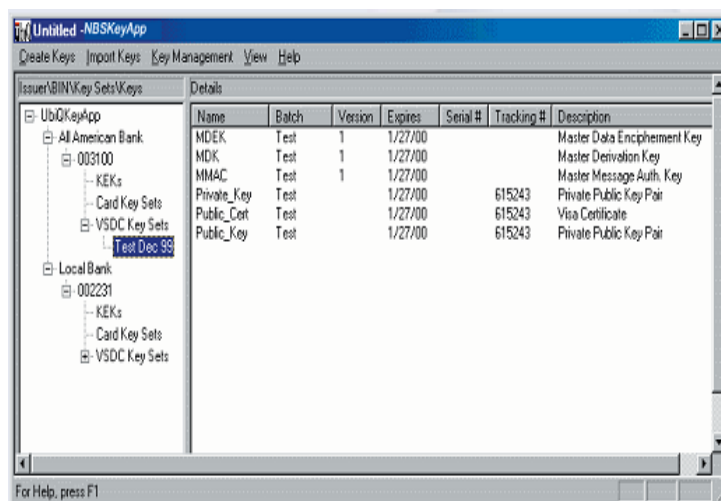

The input to the Key Master/ Key Partner module, for the purpose of creating all the keys and certificates for a Card Program is a key profile. Once the keys and certificates have been created and stored in the key vault, they are accessible to Data Preparation Module directly (if both applications are present on the same computer) or via secure transfer of the key vault contents (if the two applications are remote from one another).

The Key Master/ Key Partner and Data Preparation System are two distinct self-sending modules, that can be utilize the same HSM and key vault in the same computer, or they can be placed in separate computers and at separates locations. This allows one location to manage the keys while other locations simply use the keys in production. The second location has no need to manage the keys, only use them. This architecture is vital to providing support for centralized key management without forcing the installation of a data preparation system at each location.

2.3.1.3 CARD ISSUANCE MODULE

Card Issue Module is the industry leader in supporting various card personalization equipment types. It runs as a compliment to Data Preparation Module and has been used in the issuance of millions of multi-application smart cards all over the world. It runs on a computer attached to a card personalization device and manages the smart card personalization process. By using Card Issue Module, multiple personalization devices from different manufacturers can be supported simultaneously and run in parallel.
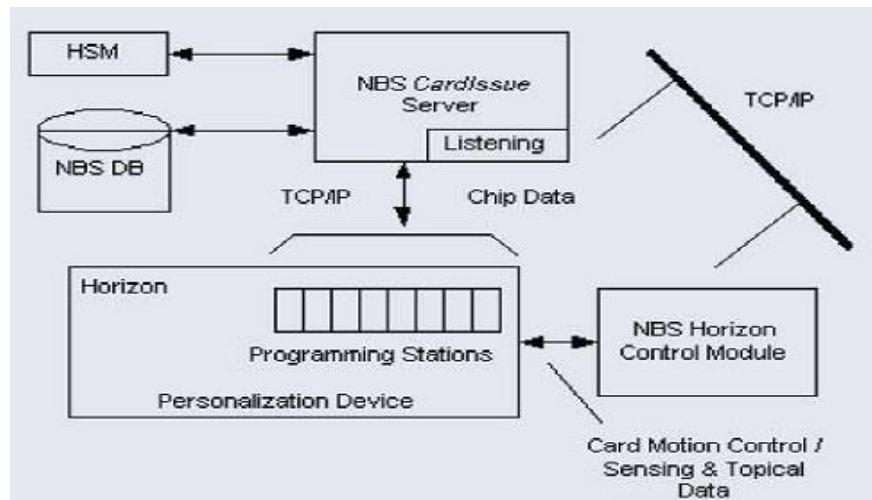
Advantages of Card Issue module includes:

a) Supports multiple personalization devices from different manufacturers
b) Supports a Smart Production process (Intelligent file format)
c) When adding support for new applications no updates to Card Issue System or the personalization equipment are required most of the time
d) Card Issue System can be configured to support remote issuance
e) Support multiple audit/return files. Each application that is personalized can have its own unique audit file that can be returned to a host system. Card Issuance System has no limit on the number of audit files that can be produces for each production run.

2.3.1.4 CARD PROGRAM FOR UPI GLOBAL PLATFORM CARD

Card program is a personalization script to personalize EMV compliant Visa's VSDC application. The card program will be developed and customized to perform this processes.

ABA BANK is responsible for providing a detailed list of the EMV tag settings. This data information is required to be communicated to HBI for integration into the card program and must be received at least 4 weeks before installation of a new production card program.

2.4 PROPOSED HARDWARE COMPONENT

This section describes the hardware system component to implement the EMV Compliant Card Issuance System. This includes:

a)   SafeNet Protect Server HSM

b)   PC for EMV Applications

2.4.1 SAFENET PROTECT SERVER HSM

A total of one unit of HSM is required for EMV Compliant Card Issuance System. The HSM is configured to be used with each of PersoMaster module; Data Preparation and Card Issue.

The SafeNet Protect Server Gold model PL220 HSM, incorporates a 64 bit PCI interface, 4Mb secure storage capacity and a dedicated cryptographic processor to deliver high-speed cryptographic processing for cryptographic operations and fast transaction speeds. SafeNet Protect Server Gold is a FIPS 140 - 2 Level 3 certified PCI adapter-based HSM that can be installed in server systems as a cryptographic subsystem to perform symmetric and asymmetric cryptography. All cryptographic operations that would otherwise be performed on the insecure server are processed within the physically secure HSM to ensuring sensitive keys are always protected from compromise.

Specification	Descriptions
Cryptographic Algorithms	• Symmetric - AES, DES, 3DES, CAST-128, RC2, RC4, SEED, plus others on request; Modes supported include ECB, CBC, OFB64, CFB-8 (BCF) • Asymmetric - RSA (up to 4096 bits), DSA, ECDSA (up to 512 bits) Diffie Hellman (DH)
Host Platforms	• Protect Server Gold can operate in conjunction with the host-based cryptographic APIs Protect Toolkit C, Protect Toolkit J, Protect Toolkit M, Protect Toolkit EFT and Protect Processing.
Host Connectivity	• PCI 2.2 compliant interface (32 bit or 64 bit, 33 MHz or 66 MHz) • Supports both 3.3v and 5v signaling
Power Requirements	• Voltage - +5 Volts (550 mA), +12 Volts (20mA), -12 Volts (20mA)
Dimension	• 231mm x 18.7mm x 105.5mm or 9.1" x 0.73" x 4.15" (w/h/d)
Operating Environments	• Temperature - 0° to 40°C (32 to 104 °F) • Relative Humidity - 5 to 95% non-condensing

2.4.2 PC FOR EMV APPLICATIONS

A single unit of PC is required to install the software component. The PC is for the following application:

a) Data Preparation PC: Used for installation of all PersoMaster modules (Data Preparation, Key Master and Card Issue).

The recommend PC specification as follows;
- 2nd Generation Intel® Core™ i5-2400 Processor (3.10GHz,6MB)
- 2 GB DDR3 SDRAM 1333MHz
- 500GB SATA 7200 RPM Hard Drives
- Tower Like PC with Open PCI Slot for SafeNet Protect Server Gold PL220 HSM
- CD ROM Drive
- LAN Ethernet Adapter
- Windows 7 or Windows 8 Operating System

SECTION

3

PROJECT MANAGEMENT & PROFESSIONAL SERVICES

3.1 SCOPE OF WORK FOR PROJECT MANAGEMENT AND PROFESSIONAL SERVICES

There are a number of specific components to all EMV implementations which warrant description and attention. We have listed the primary components and associated responsibilities which are part of our implementation below. As part of this offer we are proposing part of our consulting services which will assist in guiding you though the deployment process and ensuring that Visa's approved practices, including PCI-DSS compliance, are complied with throughout the end-to-end production cycle.

This project focuses on bringing you online with our EMV Solution for the Card Issuers. This project requires the following activities be completed on site:

3.1.1 INSTALLATION OF CORE EMV INFRASTRUCTURE HARDWARE AND SOFTWARE

Installation of PersoMaster application on a production class server PC is done at a central office site. This includes one Server class Intel hardware, Monitor, HSM and Dongle. This also includes the delivery of one Card Program (UPI). If you need another card program, there will be added costs which are mentioned as optional.

Note: Card programs typically require a minimum of 3-4 weeks advance notification.

3.1.2 INSTALLATION & TESTING OF CARD PROGRAMS

a) Demo Card Program: As indicated above a 'test' card program will be implemented to confirm printer connectivity and operation of the implementation. It also can be used for gaining MasterCard and Visa certification.

b) Input Files and Data Conversion Map: The standard process is for the bank to provide us with their standard magnetic stripe production file. We plan to enable the bank to continue using this file format. However, as part of the data preparation process we convert it to a smart card compliant format using a data conversion map. We will supply one data conversion map for each card program installed.

c) UPI Parameters: The EMV setting will be configured and provided by Bank for this Card Program.

d) HBI will test the following card program:

- One card program; to personalize UPI application based on Global Platform OS Card

e) The following information needs to be validated by end user.
- Card Program Issuer: _____
- Card Program BIN: _____
- Card Program Name: _____

- New Version Name: _____

3.1.3 CUSTOMERS' REQUIREMENTS

Customer must provide:

a) Sample input file
b) Customer will provide the necessary communication environment (LAN, Internet)

3.1.4 Target Hardware

a) DataCard 280P desktop embossing machine

3.1.5 Risk & Assumptions

a) The correct key value for the new key is added to the KeyMaster module.

b) HBI does not confirm that the card functions end-to-end. It is the Bank's responsibility to perform the requisite end-to-end test which ensures terminal and point by point operation.

c) All required resources (system administrator, project manager etc.) will be available during the onsite infrastructure implementation.

d) A card program version will be defined in PersoMaster™.

e) Input files need to be provided to HBI at time of that input file format can be implemented, but it requires a few weeks of work.

3.1.6 Schedule of Deliverables

A specific timeline and project schedule will be provided by our Project Manager following the initial kick off meeting.

SECTION

4

COMMERCIAL OFFER
EMV COMPLIANT CARD ISSUANCE SYSTEM

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4.1 EMV-Compliant Card Issuance System for UPI

Item	Description	Qty	Price (USD)	Total (USD)
1	**PersoMaster EMV Card Issuance System- Desktop Version** • Data Preparation Module • Key Master/ Key Partner Module • Card Issue Module • Dongle and License	L/S	59,000.00	59,000.00
2	**EMV-Compliant Card Program** • One UPI EMV Card Program based on HBI UPI EMV Certified Card			
3	**SafeNet Protect Server Gold PL 220** • PCI Card HSM Module • The *PersoMaster*™ suite interfaces to the SafeNet HSMs using the PKCS #11 interface and proprietary SafeNet extensions. These cryptographic modules have been certified under FIPS 140-1 Security level 3. • Cryptography Algorithms 　o Symmetric - AES, DES, 3DES, CAST-128, RC2, RC4, SEED, plus others on request; Modes supported include ECB, CBC, OFB64, CFB-8 (BCF) 　o Asymmetric - RSA (up to 4096 bits), DSA, ECDSA (up to 512 bits) Diffie Hellman (DH) • Product dimension 　o 231mm x 18.7mm x 105.5mm or 9.1" x 0.73" x 4.15" (w/h/d)			

4	**SmartSys Machine Control Software** • Software to control desktop embossing machine and to be integrate with Card Issue module during data personalization process.				
5	**Desktop PC** The PC specification as follow: • 2nd Generation Intel® Core™ Processor • 2 GB DDR3 SDRAM 1333MHz • 500GB SATA 7200 RPM Hard Drives • Tower Like PC with Open PCI Slot for PL 220 HSM • CD ROM Drive • LAN Ethernet Adapter • Windows 7 Operating System				
6	**Project Management & Professional Services** • Installation & Commissioning of EMV-Compliant PersoMaster System • End user training • Implementation Project Management • Analysis and Finalization of Bank Requirement • Installation of Core EMV Infrastructure Hardware and Software • EMV System Configuration and Testing • EMV Certificate Request • Live BIN Configuration and Testing • Pilot Production and User Training • Initial support during 3 months warranty period				
7	**Additional Card Program (Optional)** • One EMV Card Program for Visa VSDC on Global Platform • One EMV Card Program for MasterCard M/Chip on Global Platform	1 1	9,800.00 9,800.00	9,800.00 9,800.00	

4.2 Annual Software License & Maintenance

Item	Description	Qty	Price (USD)	Total (USD)
1	Annual License & Maintenance for PersoMaster EMV Card Issuance System- Desktop Version	1	6,000.00	6,000.00

4.3 EMV Technical Workshop Session

Item	Description	Qty	Price (USD)	Total (USD)
1	One full day EMV Technical Workshop	1	F.O.C	F.O.C

4.4 Terms and Conditions

Price	• All prices quoted are excluding any freight, sales or government tax.
Scope of work	HBI will be providing the hardware, software, installation, configuration, project management and user training.
Time schedule	• Hardware & Software: 6~8 weeks • Card Program: 8~10 weeks

Payment terms	• Hardware & Software
	  o 50% upon PO issuance
	  o 50% prior to the delivery
	
	• Project Management and Professional Services
	  o 50% prior to the delivery
	  o 50% upon completion of installation

Warranty Period	3 months
Validity	This proposal is valid up to **31st August 2014**

End of Proposal