MULTOS for EMV Migration
The “Multi-Application Operating System Consortium”

Established MAOSCO Ltd and Consortium in ‘97 to promote MULTOS as an open standard

Documents, Type Approves, & Licenses MULTOS

Funding, Spec Control, Implementations*  
(*excluding Alliance members)
Contents

- The Lifestyle card concept
- Chip services that bind the consumer to the issuer
- Case studies of successful lifestyle chip card programmes
The Lifestyle card concept
Most people’s lifestyles consist of...

Things we have to do...
- Subsisting
- Studying
- Working
- Commuting

Things we ought to do...
- Staying Healthy
- Saving
- (Therapeutic) Shopping
- Staying in touch

Things we like to do...
- Playing
- Relaxing
- Holidaying
- Indulging

How to have more time (and money) to do more of what we like and less of what we have to?
How can the card help?

- Traditional Credit Cards can be tailored to the consumer’s:
  - Financial situation:
    - Low APR for high borrowers
    - Cashback for big spenders
  - Spending locations:
    - Rewards for spending with affiliated merchants
    - On-line purchase protection
  - Travel patterns:
    - Travel Insurance
    - Roadside Assistance
  - Altruistic tendencies:
    - Percentage of transaction donated to charity
  - Image:
    - Co-Branded / Affinity cards with special designs
    - New form factors
How can the SMART card help?

As chip accepting infrastructure in physical channels becomes ubiquitous, so new opportunities will be afforded to create a combination of services on a multi-application smart card that facilitates the consumer’s lifestyle:

- Contactless Ticketing
- Secure payments (Chip & PIN)
- Low Value Payment at Unattended POS
- Earning and redeeming rewards at POS
- To Health or Govt Services
How can the SMART card help in new channels?

To Managing Finances Securely and Conveniently

To Entertainment on Demand

Earning and redeeming rewards with Virtual Merchants

To Secure Virtual World Shopping with Credit (Chip SecureCode) or e-Cash

To Virtual Health, Govt or other Services

To store personal data for convenience on-line

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To Entertainment on Demand
Chip services that bind the consumer to the issuer.
1. Chip Based Loyalty

- **Convenience**
  - Loyalty function combined with payment card – so not left at home, and automatically credited.

- **Flexible Response**
  - POS can react to on-chip data, depending on Recency of visit, Frequency of visits, or Monetary value spent (RFM). Response can be individualised to consumer.

- **Immediate Rewards**
  - Consumer can be rewarded instantly. Or rewards can be downloaded to card for use later.

- **Multi-Channel**
  - Same solution can be supported at Physical POS or Virtual Channels where card can be read – e.g. Kiosks, PC card readers at home / work.

- **Minimal incremental cost**
  - Loyalty function can be combined with EMV on multi-function chip – or added later to true multi-application cards.
2. Smart (Contactless) Ticketing

- e-Tickets can be purchased online, and downloaded to smart card over “contact” interface.
- Ticket can then be spent over chip’s contactless interface in transport system gates – for speed of boarding / entry
- Can enable proximity payments – pay as you board
- Could be linked with chip rewards scheme
- Card becomes essential tool for travel – achieving top of wallet status
3. Storing useful personal info

- Offer cardholders ability to control the information stored on their card
  - Frequently used personal details (name, address, billing details)
  - Credit card numbers
  - Favourite web addresses, including username and password.
  - ALL PROTECTED BY CHIP & PIN
- E.g. MasterCard “Open Data Storage” Solution:
  - Web pack consisting of Smart card, PC software and USB Card Reader with Integrated Pin-pad.
  - MODS is a flexible data storage platform that can also be configured to support ticketing, loyalty etc.
Using chip to create the killer combination:

- EMV
- PKI
- E-Cash
- Loyalty
- Health
- Transit
- Access
- E-Ticket

**Issuer’s Applications**

**3rd Party Applications**

Combining issuer & 3rd party applications can offer a killer combination. Guaranteeing “top of wallet” positioning for a financial card issuer.

- Mall Shopper
- City Worker
- Private Health User
- Internet Gamer
- Pet Lover
Successfully realising a varied chip application portfolio

- **Flexibility to mix and match applications**
  - Native OS cards have apps fixed at masking.
  - Open standard MULTOS cards, have a Virtual Machine that separates the apps from the OS. So applications are loaded into programmable E2PROM memory at, or post, personalisation:
- **Create and add new applications to existing “packages” quickly and easily**
  - Open standard VM cards allow in-house or 3rd party chip application development (in C OR Java).
- **Take advantage of new technologies that enable new value added apps or other benefits**
  - Open standard VM cards enable issuer to switch silicon to take advantage of new features (e.g. contactless ticketing), bigger memory sizes, lower cost chips – no need to redevelop application or perso software.
  - For efficiency, standard app code can be “codeletised” in ROM on any MULTOS chip
- **Flexibility is guaranteed by End to End MAOSCO type approval and ITSEC E6 High certification**
What if issuers could benefit from open standard MULTOS for all their cardbase......?

Issuance costs for standard MULTOS products range from approx $2.00 to $5.00 a card.

So for EMV only with SDA, native card costs look more attractive. But what if…?
The MAOSCO Consortium Presents:

- **MULTOS step/one:**
  - An entry level MULTOS platform for SDA EMV migration
  - A multi-application, interoperable alternative to native card platforms which brings all the benefits of MULTOS:
    - Open standard – still allows apps to be developed in C or Java, compiled for one MULTOS chip, and run on another. Will run any existing MULTOS app*
    - Multi-sourceable – still MAOSCO type approved
    - Secure – maintains MULTOS security architecture
  - With the added benefits:
    - Competitive with native card issuance costs (*does not require RSA, and can run on small E2PROM)
    - Card issuance utilises flexible load certificate generation process
    - Provides a migration path to PKI and multi-application

- New MULTOS Platform Specifications developed by MAOSCO Consortium members over past 9 months, and signed off Nov 2003.
  - First product optimised for issuers of EMV with SDA expected Q1 2004.
Case studies of successful lifestyle chip card programmes.
Mall Shopper Smart Card Case Study: Core Pacific City Cosmos Bank Taiwan
Background - Core Pacific City Mall

- Core Pacific City mall has been in development since 1986
- Planned and designed to be the biggest mall in Taiwan, catering to all age groups and demographics
- 1200 retailers, include 800 credit card merchants and other cash only retailers
- Expected turnover of NT$20 billion (£370 million)
- 205,000 square meters
Core Pacific City was very keen to provide a co-branded card for:

- brand value
- consumer loyalty
- creation of a secure transaction environment

The requirements for the card were:

- Technically advanced - seen by the market to be the most up to date product
- Provide cardholder loyalty for shopping at the mall
- Eventually encompass all retailers - credit card or cash
The Cosmos / Core Pacific City Mall Smart Card

- 16K MULTOS Chip ($1.99 programme) ✓
- M/CHIP Select (DDA) ✓
- Mondex e-Cash ✓
- Loyalty ✓
- 8K free for other Applications
Card Acquisition

- Pitched as modern, secure and the card for the mall in Taiwan; acquisition included
  - Advertising on TV, News Paper, Take Ones
  - Public communications via media conferences
  - Co-marketing with the Mall
  - Over 200 direct sales staff in the mall from 10:00 am till midnight every day
  - Cosmos has been supporting online direct sales since grand opening on Nov 19th 2001
Progress To Date

- Card tested in Japan, Korea and Europe successfully
- A new chip floor limit approved in which the floor limit for chip transactions have been raised from NT$0 to NT$5,000 (£90)
- All retailers accept the card at the Mall
- Over 1,200,000 cards issued to date – all new cards by acquisition
- Awareness of the card and mall proposition is high
- Justified as all banks in Taiwan implemented guidelines in December 2001 for migration to EMV
Project Review

Has the project been successful?

YES - This project has

- Lifted Cosmos into the top ten issuers in Taiwan
- Established Cosmos as a leader in chip as well as one of the most advanced banks in the region
- Setup the bank to take full advantage as the migration to chip gathers pace
- Enabled Cosmos to protect and future proof their cardholder base, increase acquisition, retention and usage
Kookmin Bank launches the “TradePass” Credit and “FreePass” Debit card.

“TradePass” Credit card Co-Branded with Co-Ex Mall in Seoul. Package of applications targeted at Co-Ex workers and residents.
- Transport application for use on Buses / Metro for travel to / from Co-Ex Mall.
- e-Cash for use in vending machines, parking meters, shops in Mall.
- EMV Credit application (M/Chip) for physical world EMV payments
- 300,000+ credit cards, 1,000,000+ debit cards issued
- Started with dual chip MULTOS cards – now switching to dual interface MULTOS Mifare chips.
“Health One Card” – co-branded credit card issued by BC card in partnership with “Virtual Medical Doctor”.

Targeted at consumers with private health insurance offering a more convenient means of accessing health care services.

- Card carries Personal Health Records and details of entitlement for emergencies
- Enables secure virtual consultations with trained medical consultants over the internet. Customers use their chip based digital ID and smart card reader at home to log onto “Virtual MD” website.
- Virtual MD doctors can download an electronic prescription to the card over the internet, which the cardholder can redeem at local Pharmacies which accept the HealthOne card.
- Payment for services using the EMV Credit (M/Chip) application.
20m MULTOS cards issued to date.

New England Partners Health Card
CIBC Canada
Amex US
Credomatic Costa Rica
Bco. Mercantil / de Venezuela
Amex Brazil
Banrisul Brazil
Metris Bank USA
Syntiq NL
Banamex Mexico
Ghana Comm Bank

Amex Europe
Credit Mutuel France

Norsk Tipping Norway
Snoras Lithuania
Koper Slovenia

Kookmin, BC, Samsung Korea
Pocket, Daiei, CF, JACCS, JUSCO, Diners, JCB Japan
Cosmos, Taipei, Hsinchu, ACER, Taiwan

** NEW ** 17 million IDs Saudi Arabia

Bank Islam Southern Bank Malaysia
Nextstage Philippines
HK Immigration Hong Kong
ANZ Identrus Australia
Amex Australia

i.Life Card Hong Kong

HK Immigration

J-Smart, e-Cash, Loyalty
J-Smart, e-Cash, ID
J-Smart, ID, Edy

M/Chip, Pet Health
M/Chip, e-Cash, Tourism
M/Chip, e-Cash, Calling Card
M/Chip, Internet Content Control, e-Cash
M/Chip, Health, ID
M/Chip, e-Cash, Transport, Internet Access
M/Chip, e-Cash, Transport, Loyalty
M/Chip, BO, Moneo E-Cash, Campus
M/Chip, Secure Banking
EMV, PKI, IDKeeper
EMV, T&E
M/Chip, Loyalty E-Cash, Internet ID
EMV, PKI Passport, Biometrics, Driving License, PKI.
Digital ID, e-Gaming

Ghana Comm Bank

Syntiq NL
Banamex Mexico

Metris Bank USA

Amex Europe
Credit Mutuel France

Norsk Tipping Norway
Snoras Lithuania
Koper Slovenia

Kookmin, BC, Samsung Korea
Pocket, Daiei, CF, JACCS, JUSCO, Diners, JCB Japan
Cosmos, Taipei, Hsinchu, ACER, Taiwan

** NEW ** 17 million IDs Saudi Arabia

Bank Islam Southern Bank Malaysia
Nextstage Philippines
HK Immigration Hong Kong
ANZ Identrus Australia
Amex Australia

i.Life Card Hong Kong
**Questions?**

- General MULTOS Information:
  - [www.multos.com](http://www.multos.com)

- Questions about development of applications or issuing MULTOS cards with M/Chip:
  - [Kms_support@multos.com](mailto:Kms_support@multos.com)

- Or direct to MAOSCO Ltd:
  
  Tim France-Massey  
  MAOSCO Ltd  
  47-53 Cannon St  
  London EC4M 5SH. UK.  
  tim.france-massey@multos.com  
  +44 20 7557 5462