

Standards for RFID Systems in Australian Libraries

What does it all mean and why should
you care?

ALIA Conference - Perth WA, September 2006

Discussion outline

- Introduction to RFID standards & Benefits
- What the RFID standards don't cover
- What is being done to close the gaps
- Goals of the Standards Australia working group
- Progress to date and next steps

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Standards Bodies

- Standards may be set at many levels

International

National

Industry or trade association

Individual organisation

- Two areas of standards activity in RFID

1. International Standards Organisation (ISO)

2. EPC Global / GS1 - GDSN

Global Electronic Product Code for consumer goods

The “Internet of things”

ISO Standards in Libraries

ISO 15693

3 Part standard defining parameters for vicinity RFID cards

- Started in 1995 - first published in 2000
- Three parts:
 - Physical Characteristics
 - Air Interface
 - Communication Protocol

ISO Standards in Libraries

ISO 15693

3 Part standard defining parameters for vicinity RFID cards

- Started in 1995 - first published in 2000

- Three parts:

 - Physical Characteristics

 - Air Interface

 - Communication Protocol

- Established standard - received broad acceptance

- Some experts felt it didn't address all the issues

ISO Standards in Libraries

ISO 18000 family

Parameters for air interface communications

- ISO 18000 family has multiple parts
- Each part corresponds to a particular frequency range

ISO Standards in Libraries

ISO 18000 family

Parameters for air interface communications (builds on 15693)

ISO 18000 - Part 1 Generic Parameters

ISO 18000 - Part 2 Communications below 135Khz

ISO 18000 - Part 3 Communications at 13.56 MHz

ISO 18000 - Part 4 Communications at 2.45 GHz

ISO 18000 - Part 5 Communications at 5.8 GHz

ISO 18000 - Part 6 Communications at 860-930 MHz

ISO 18000 - Part 7 Communications at 433.92 MHz

ISO Standards in Libraries

Benefits of HF (13.56 MHz) for the library application

- Widely adopted by libraries already
- Operates at 13.56 MHz internationally - global solution
- Excellent immunity to environmental noise & interference
- Reliability of bulk tag reading
- Less affected by human body shielding - used for EAS security
- Small tag size
- Appropriate reading range
- Low cost tags and readers
- Harmonised regulatory environment - global application
- Ideal for item level tracking
- Supported by many suppliers of RFID tags and readers

ISO Standards in Libraries

Review

- ISO 15693

Except for part 1 (smart card physical specification)

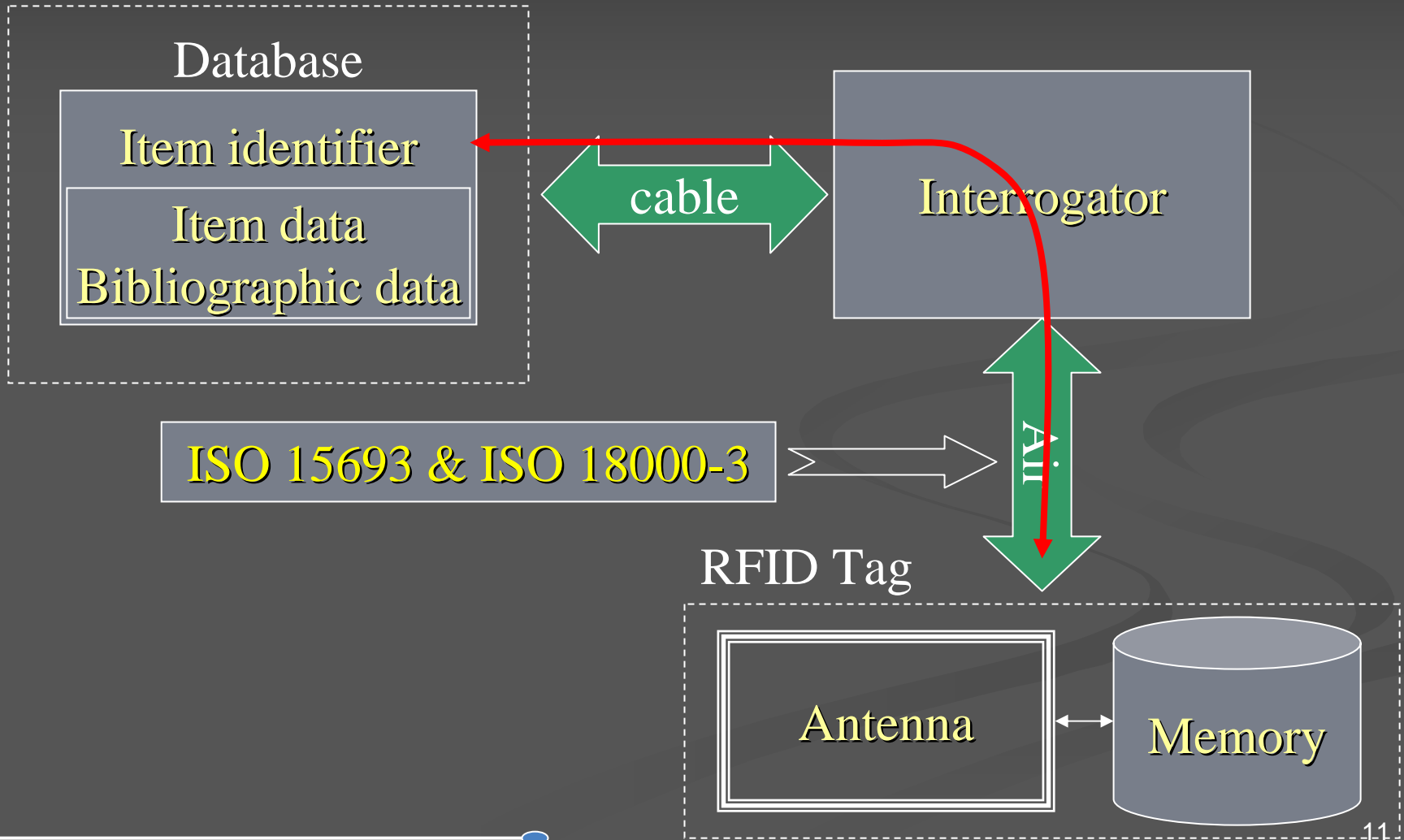
- ISO 18000-3 (communicates at 13.56 MHz)

Libraries use Mode 1

Mode 1 compatible with ISO 15693

Where do the standards fit?

Library system



What are the benefits?

■ Purchasing

ISO tags are available from a range of suppliers

Not locked into purchasing from a single supplier

Cooperative purchasing possible

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What don't the standards cover?

Not prescribed in the standards:

- The Tag Data Model

 - What specific data is written to the tag

 - How the data is arranged on the tag

 - The data encoding standard

 - The item security methodology

- Privacy and data security mechanisms

What are the implications?

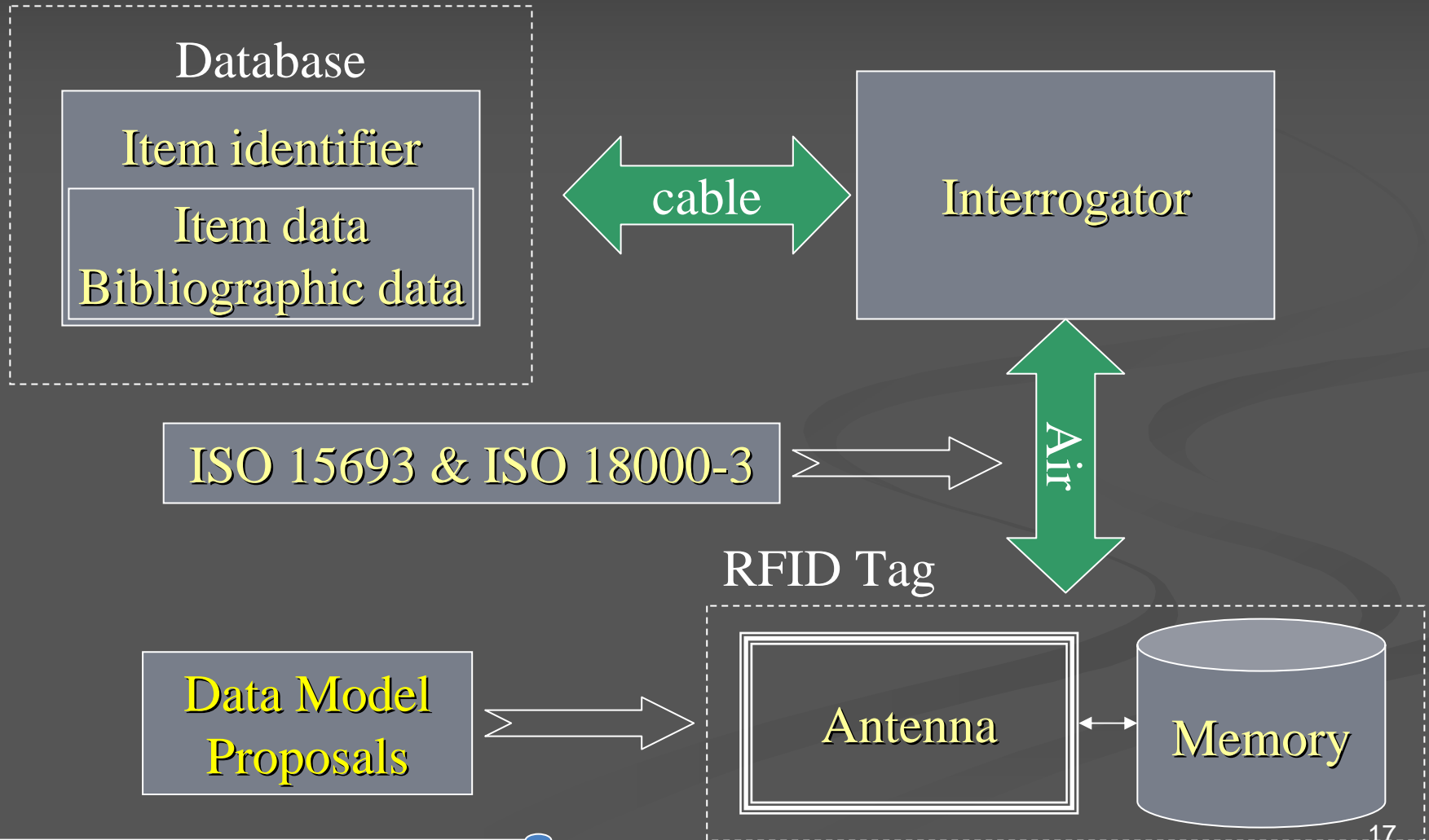
- No interoperability between systems
 - Adjacent systems with ISO tags - cannot be read
- Reprogram tags when swapping vendors
 - Tags require reformatting to suit new vendor
- Difficult to mix & match equipment
 - Self serve loans devices
 - Self Serve returns devices
 - Hand held devices

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RFID system for libraries

Library system



RFID Data Model for Libraries

- Provides a structure in which to place data
 - The format of the data fields
 - The arrangement of the data fields
- Specifies how the data will be encoded
- Specifies the methodology for item security
- Specifies what is mandatory vs optional

Danish Data Model

RFID Data Model for Libraries



Proposal for a Data Model

RFID Data Model for Libraries Working Group
Affiliated to Danish Standard S24/u4

Final document - July 2005
Status: Public

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Morten Hein, Hein Information Tools (chair)

Danish Data Model

Three part prescriptive data model

Mandatory Part

Structured
Extension Part

Unstructured
Extension Part

All applications can read
this part

Some applications
can read this part

Danish Data Model

	Mandatory Part	Structured Extension Part	Unstructured Extension Part
Metadata elements	AFI CRC Standard Version Type of Usage	CRC	Not Defined
Item data elements	Primary item ID Number of parts Ordinal part no.	Alternate item ID	Not Defined
Library data elements	Country of owner library Owner library	Extended owner library	Not Defined
Application data elements	None	Media format	Not Defined
Supplier data elements	None	Item identification Order number Invoice number	Not Defined

Prescriptive models - problems

- Difficult to gain agreement about data elements
- Very limited flexibility
- More appropriate for local needs than international use
- Large mandatory part may not suit all libraries
- Can be inefficient in some applications
- Truism: prescription begets more prescription

Finnish Data Model

	Mandatory Part	Structured Extension Part	Unstructured Extension Part
Metadata elements	AFI CRC Standard Version Type of Usage	CRC	Not Defined
Item data elements	Primary item ID Number of parts Ordinal part no.	Alternate item ID	Not Defined
Library data elements	Country of owner library Owner library	Extended owner library	Not Defined
Application data elements	None	Media format	MARC Media Type
Supplier data elements	None	Item identification Order number Invoice number	Not Defined

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RFID Standards Project - Working Group Members

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Goals of the Working Group

- To articulate the issues involved
- To understand what is being done internationally
- To study the Danish Data Model proposal
- To isolate any unique Australian factors
- To provide feedback & proposal through IT-019
- To act as a resource within the library community

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RFID for Libraries

Standards Australia Working Group IT-19-01-02

Proposal for a Library RFID Data Model



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Status: Draft 06 September 2006

Conclusions &
 recommendations of the
 working group are
 about to be submitted to
 ISO

Working Group Proposal

- To create a data model with maximum flexibility
- To lay a foundation for full interoperability
- To present a realistic project for vendor implementation
- To use existing standards where possible
- To mandate the minimum of data
- To allow for future technology or market changes

RFID system for libraries

Library system

Database

Item identifier

Item data

Bibliographic data

ISO 15961

ISO 15962

cable

Interrogator

ISO 15693 & ISO 18000-3

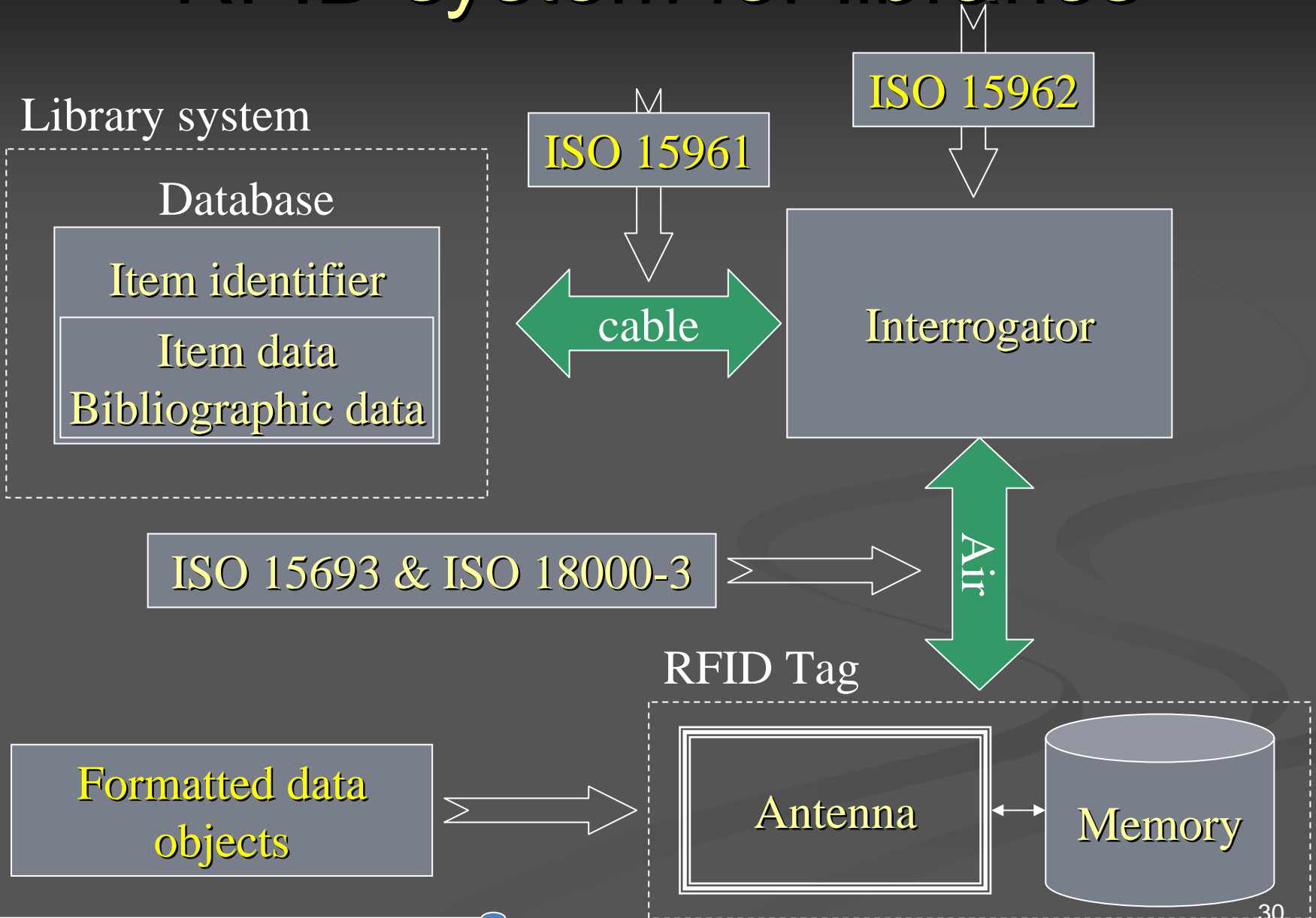
Air

RFID Tag

Formatted data objects

Antenna

Memory



Australian Data Model

Multi part data model

Mandatory Part
Primary Item ID

Optional Data
Object #1

Optional Data
Object #2



All applications can read all parts

Proposal advantages

- Creates a standardised Data Model
- Provides great flexibility for library customisation
- Provides a path towards open RFID systems
- Enables vendors to stage the implementation
- Mandates a minimum of data (item ID & security)
- Easily upgradeable - new objects may be added
- Allows for technology changes

Next Steps

- ISO ballot close October 12th - International project
- Standards Australia to submit working group's doc.
- Standards Australia have nominated a National Expert
- First ISO meeting - Copenhagen December 1st 2006
- International standard for a data model to be developed
- Australia will decide if it is suitable for national use

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To obtain a copy of the handouts from this
presentation visit www.sybis.com.au