

2nd Canadian RFID Conference

SHARING THE FACTS; DISPELLING THE MYTHS.



RADIO FREQUENCY IDENTIFICATION

“Tracking the Evolution of RFID Technology and its Applications”

Two Day Conference ♦ April 19-20, 2005

♦ Le Parc, Markham Ontario

Workshop: Electric Commerce and Privacy

Moderator:

Doug McIntyre, C.A. Director, Financial
Mentor Team Innovation Synergy Centre in
Markham

Speakers:

Dr. Andreas Schauer, Head of Transp.,
Ticketing & Tagging, G & D

Mike Gurski, Senior Technology Policy
Advisor, IPC of Ontario





Giesecke & Devrient

Dr. Andreas Schauer

Head of Transportation, Ticketing &
Tagging Business

Giesecke & Devrient (G & D)





RFID in electronic payment

Giesecke & Devrient

Canada, April 2005

Agenda



Giesecke & Devrient

- Overview payment market
- Overview contactless payment market
- G&D in contactless payment
- Future Outlook



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Electronic commerce

Can be

- Business-to-Business
- Consumer-to-Business

Here focussing on Consumer-to-Business

Consumer-to-Business market is

- Debit / Credit (D/C)
- Electronic Purse

Here mainly Debit / Credit





Electronic commerce

Can be

- Business-to-Business
- Consumer-to-Business

Consumer-to-Business market is focused on:

- Debit / Credit (D/C)
- Electronic Purse

Debit / Credit is the primary Consumer-to-Business application





Some figures on electronic commerce (D/C)

	Cards	Transac. Vol.	Countries	Fin. Instit.
VISA	1.3 Billion	\$3.2 Billion	150	21,000
	490 Mio.	>\$1.0 Billion	US	14,000
	229 Mio.		Asia Pacific	
MasterCard	650 Mio.			
Am. Express	1.2 Billion			

In 2003: 4.38 Billion cards to card issuer (Visa, MC, Amex, Diners, Discover, JCB, ATM cards) and retailers (Credit and Prepaid)

Contactless: 121 Mio. Cards in 2003 (in total not only payment)
516 Mio. in 2008 (Gartner Research)



Cards and Solutions for Payment Transactions



Smart debit and credit cards

- StarDC V
Visa
- StarDC M
MasterCard
- StarDC I
Italy



Electronic purses

- GeldKarte
- StarProton
- StarChina
- Quick
- VisaCash
- Danmont



PKI signature cards

- StarAccount
Internet banking
- StarCert
DINSig, digital signature



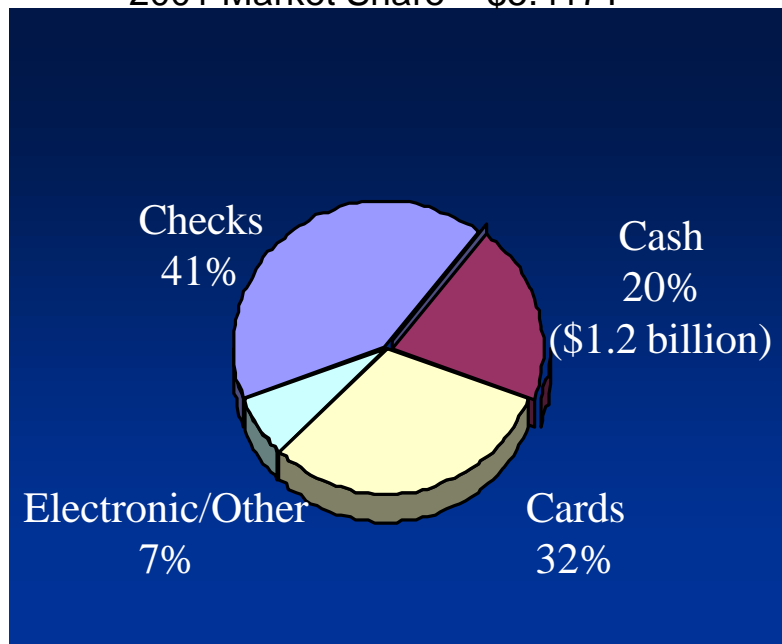
Open platform cards

- Sm@rtCafé
Java™ Card
- MULTOS™
Smart Card

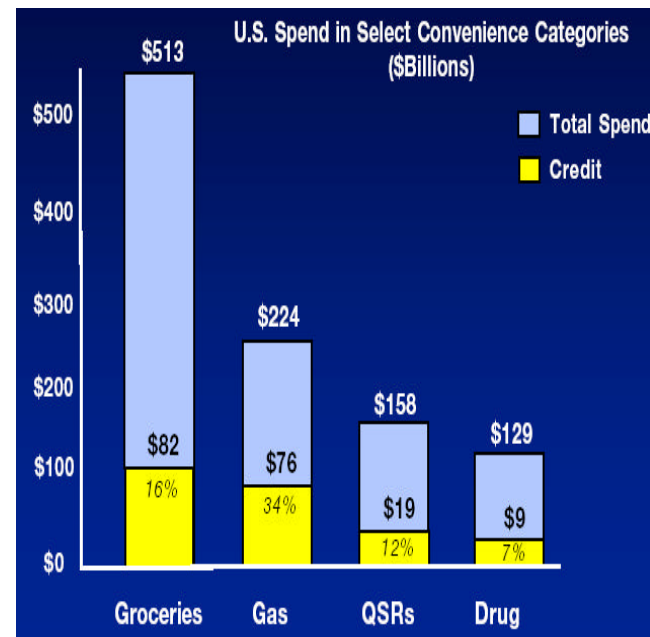
Market Opportunity

61% of consumer payment is still conducted with cash and checks

US Consumer Payment Systems
2001 Market Share ~ \$5.417T



Source: The Nilson Report 2001



Source: GMAPS, ES Reports, Forrester Research 2002, SPG analysis

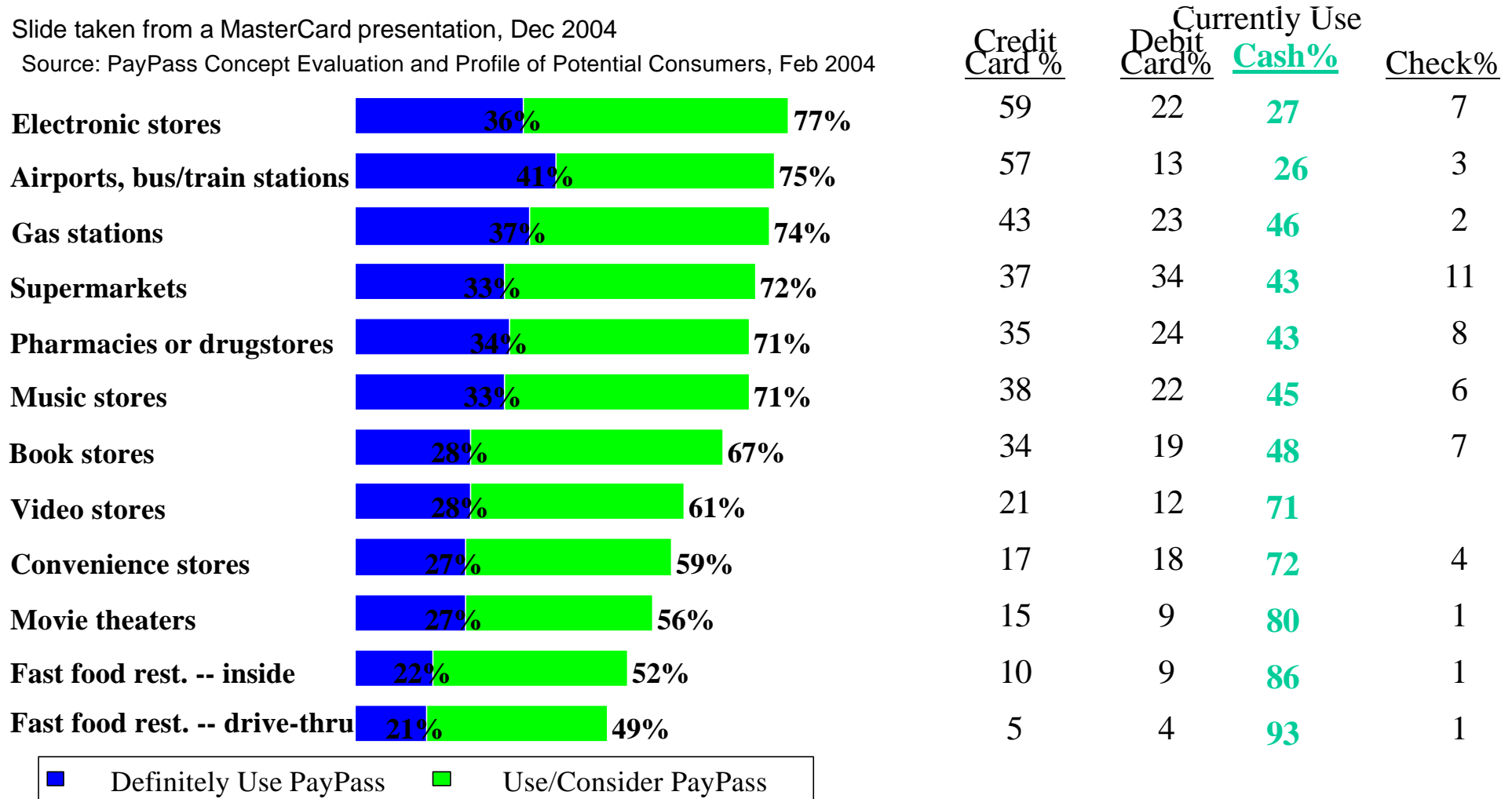
Slide taken from a MasterCard presentation, Dec 2004



Where Consumers Would Use *PayPass*

Slide taken from a MasterCard presentation, Dec 2004

Source: PayPass Concept Evaluation and Profile of Potential Consumers, Feb 2004





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Payment Initiatives: MasterCard PayPass

- 2003: First pilot (Chase, Citibank, MBNA): 16,000 consumers and 60 retail locations
- 2004: Pilots in the US (New York, Orlando, Dallas), Philippines, Japan, Singapore
- 2005:
 - McDonalds signed on for US roll-out in 2005
 - Football Clubs Seattle Seahawks, Baltimore Ravens, Philadelphia Eagles
 - 3 Taiwanese Banks will roll-out PayPass in Sept 2005 for mass transit and retail shops
 - Sheetz Convenience stores (3,100) starting June 2005 (up to now 300 locations)
 - Service agreement with Korean SK Telecom
 - MasterCard works together with Nokia to incorporate PayPass into cellular phones
 - Hong Leong Bank (Malaysia and Singapore) uses slimmed down SideCard format (Touch'n'go Zing Card), which is 30 % smaller
- approximately 3 Million cards in the US and Canada (by end of 2005)

Payment Initiatives: American Express ExpressPay

- 2002: Pilots in Phoenix
- 2003: Pilots in New York
- Now CVS (5,300 drugstores with Panasonic hybrid card readers)
Ritz (>1,000 locations) photographic chain
Sheetz (3,100 convenience stores)
signed contracts

ExpressPay is also available in Arizona and New Jersey

ExpressPay uses challenge response with 128 Bits



Payment Initiatives: Visa Wave



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- started late
- First pilot in Malaysia in 2004: pilot with 4,000 cards and 150 stores
 - Target 500,000 cardholder and 4,000 merchant locations (convenience stores, quick service restaurants, cinemas, petrol stations, supermarkets)
- Second project: Chinatrust Commercial Bank in Taiwan:
 - 25,000 cards and 150 merchants (gasoline station, video rental shops, railways, buses, parking lots, cafes, restaurants)
- Magstripe only up to full EMV



Technical issues



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- TI will have (2H05) special chips with NIST approved crypto algorithms incl. 3DES and SHA1, data rates up to 848 Bits/sec for MasterCard
- OTI has been certified by MasterCard for their contactless reader. Also certified by American Express
- Also Panasonic and Gemplus are delivering readers

- Technical basis is ISO 14443
- Reading distance is up to 10 cm
- Move towards dual interface (MasterCard and Visa)
- MasterCard and Visa share common communication protocol of MasterCard





Payment Initiatives: Exxon SpeedPass

- Pilots in Phoenix, New York at Exxon Mobil stations and a handful of other retail outlets
- SpeedPass is supported by VeriFone readers and TI chips
- up to now 6 Mio. devices
- Hacking of the TI chip (DST, 40 Bit keys)
 - TI prefers 128 Bit keys
 - TI reduces reading distance to 4 cm



Shell easyPAY Pass



Giesecke & Devrient

Customer:	Shell easyPAY Pass
Industry:	Petroleum
Field of application:	Gasoline Purchase for Automobiles
Volume:	500,000 +
Rollout:	First deliveries in 1999, project ongoing
Highlights:	The Shell gas pump reads the tag and automatically charges fuel purchase to the credit card selected when applying for the tag. It can even add AIRMILES reward miles to the AIR MILES collection account for qualifying purchases



Devices



“Regular” Card



MasterCard SideCard



Key Fob w/Button



Key Fob



Key Tag



Cell Phone



Wristwatch

Slide taken from a MasterCard presentation, Dec 2004



Advantages for merchants

- Increase average transaction value (~ 12 %)
- Faster transaction (save 8 to 12 sec at drive-through / 12 to 18 sec)
 - Quote from former McDonald's CEO Jack Greenberg:
"unit sales jumped 1% for every six seconds saved in drive-through lanes"
 - Tesco - "for every second lost we lose 1.5 million pounds"
- Increased frequency of purchases
 - increased revenues (up to 9 % / 28 to 33 %)
- Reduce staff time devoted in handling cash
 - reduced operating costs
- Improved payment terminal reliability
- Increased differentiations
- Improve loyalty
- Improve customer satisfaction in highly competitive markets





Advantages for consumers

- Convenience
- Speed
- No more fumbling for cash
- Ease of use
- Security
- Pay multiple services with one device





Target Markets

- Quick Service Restaurants
- Gas stations
- Drugstores
- Supermarkets
- Movie theatres
- Unattended vending machines
- Tollways
- Parking fees
- Transit fares
- Retail





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- **G&D in contactless payment**
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G&D in contactless



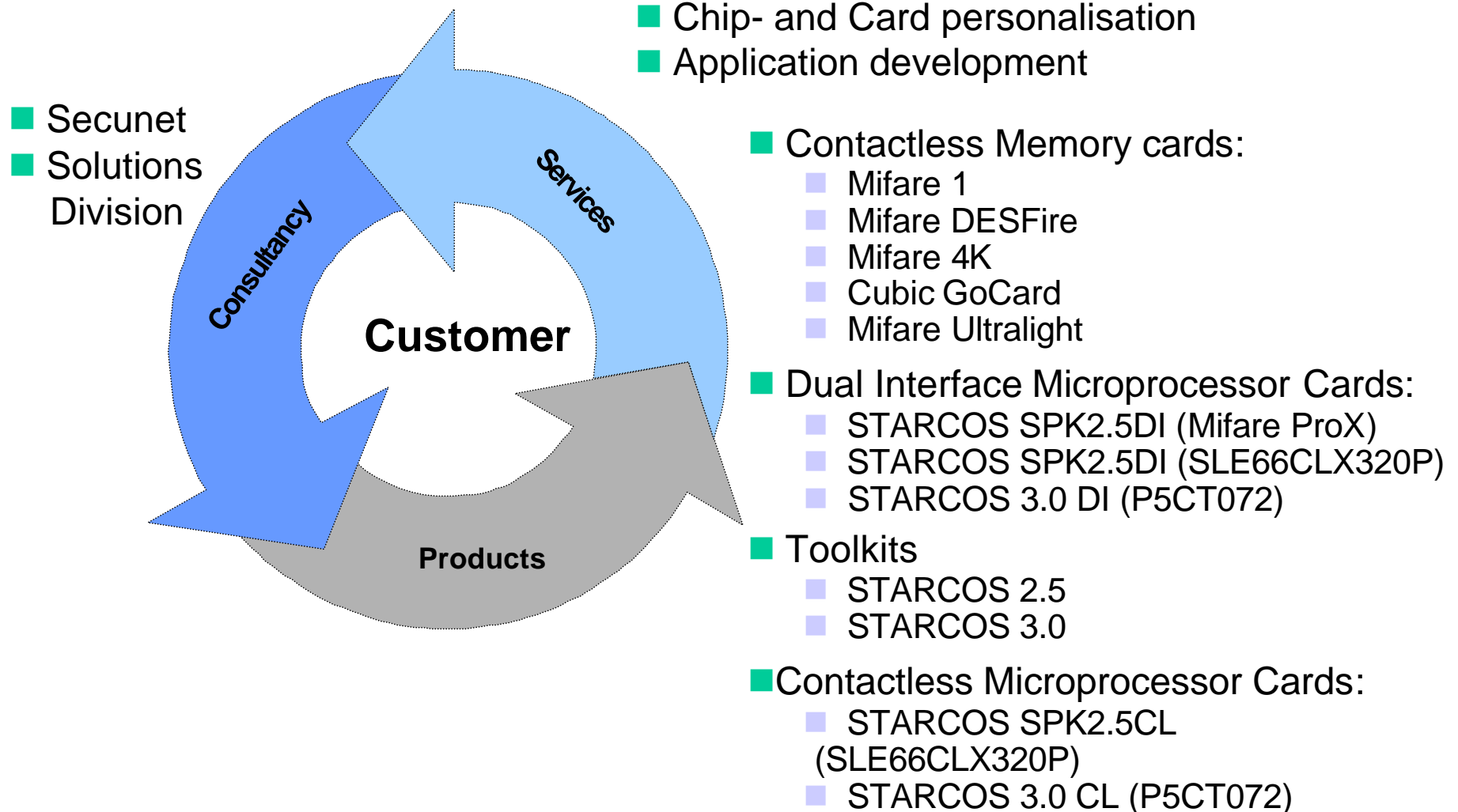
Giesecke & Devrient

- G&D is a world-wide leader in contactless technology
- G&D sets standards, advances the technology, and produces patents
- G&D works on the passport with chip, on public transport cards and on corporate ID cards
- G&D delivers MONETA cards into the Korean market
- G&D works with the automotive and lock industry
- G&D is market leader in transport in the US
- G&D works on North American pilots with contactless credit cards



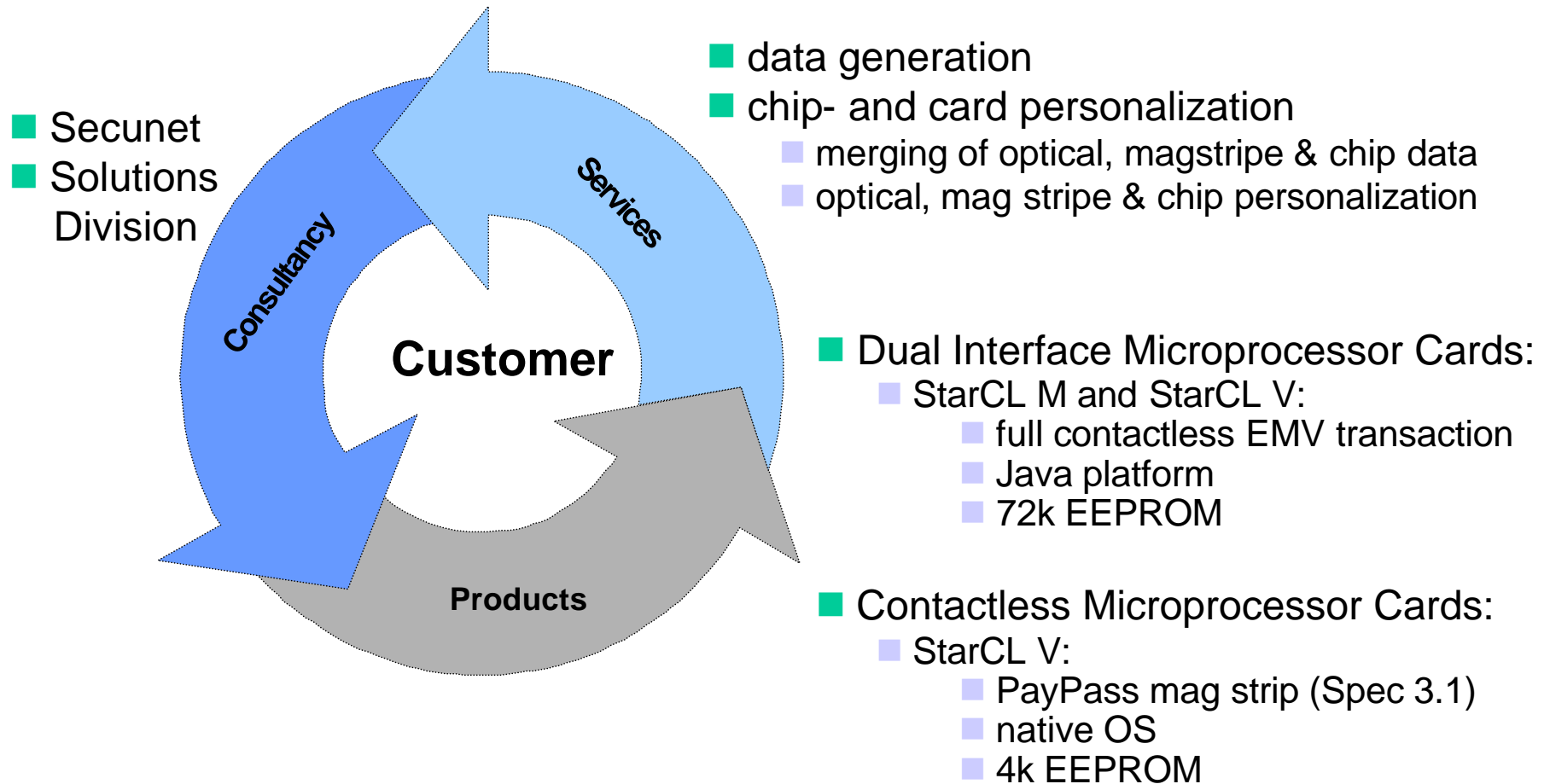


Products and services from G&D in contactless (non payment)





Products and services from G&D in contactless payment

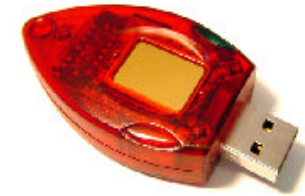




Contactless payment products from G&D

G&D can offer a complete PayPass product incl.

- Test
- Personalization
- Lettershop
- HSM
- Key management



Available on

- UPP Desktop with Pegoda reader
- DC9000 with Smartware Ultrasmart reader

All devices (cards, phones, key fob)

In the future

- Full solution provider
- SIM PayPass card (customer project required)





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Some thoughts about the future

- First person with personal barcode, medical history and credit card info on a chip under the skin
- Increased use of mobile phones with payment functionality
- Multi-applications are going to happen:
 - East Japan Railway Company + NTT DoCoMo + Sony: combine i-mode + FeliCa + Suica to pay with mobile phones for tickets
- Use of NFC
- Increased security / reduced fraud: see TI, see ePassport
- Privacy issues coming into play
- RFID will gain important market share (not only in ePayment)



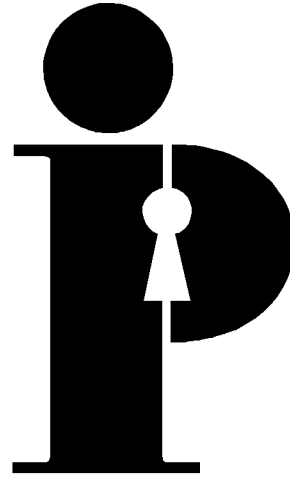


security at work.

Thank you.

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Mike Gurski

Senior Technology Policy Advisor
Information and Privacy Commissioner
of Ontario





RFID

*The Hype, The Public Concerns
and The Reality*



Privacy and RFIDs



- RFID tags contain information about a product, not an individual (e.g., EPC, price, size, colour, manufacture date)
- Despite that, many consumers perceive a threat to privacy – why is that?



Consumer Perceptions



- Consumers perceive that RFIDs may facilitate tracking:
 - The ability to track consumers who have purchased a product
 - The establishment of a widespread surveillance infrastructure
 - The linking of product information and personal information without consent



Survey Results



- Auto-ID Centre/Proctor & Gamble Internal study found:
 - 78% of respondents had a negative reaction to RFID use, with the majority claiming to be extremely or very concerned
 - Also found that consumers did not want "smart tags" in their homes, and the reassurance that the "tags" could be turned off and privacy guaranteed was not compelling

source: <http://cryptome.org/rfid/pk-fh.pdf>



Implementing RFIDs



- A failure to build privacy into the design and implementation of RFIDs can produce a consumer backlash
- This will have an adverse impact on a company's reputation and ultimately its bottom line



Consumer Backlash



- How real are consumer concerns?
- Could privacy issues potentially deter the roll-out of RFID?

Get Ready for a Good Fight



- **CASPIAN, a U.S. -based consumer rights group, claimed that:**
 - Checkpoint was developing RFID “spychips” for three well-known clothing labels
 - Consumers wearing the tagged clothing could potentially be identified and tracked by readers
 - “[We] will be working with consumers on an aggressive response to this privacy threat. Roll up your sleeves and get ready for a good fight.”
- **UK consumer group:** ThoughtCrime News: “RFID is not only the harbinger of heavy personal surveillance. It may bring an end to civilization as we know it.”



Information Privacy Defined



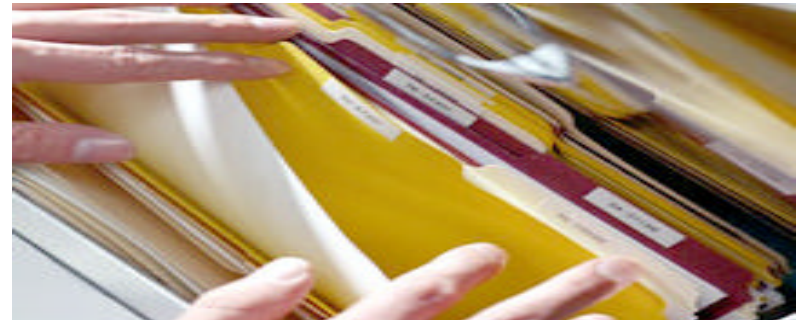
- **Information Privacy/Data Protection**
 - Freedom of choice; control; informational self-determination
 - Personal control over the collection, use and disclosure of any recorded information about an identifiable individual



Summary of Fair Information Practices



- Accountability
- Identifying Purposes
- Consent
- Limiting Collection
- Limiting Use, Disclosure, Retention
- Accuracy
- Safeguards
- Openness
- Individual Access
- Challenging Compliance



Federal Private-Sector Privacy Legislation



- *Personal Information Protection and Electronic Documents Act (PIPEDA)*
- Applies to personal information collected, used or disclosed in the course of commercial activities by all:
 - federally regulated organizations and
 - provincially regulated organizations, unless a **substantially similar** provincial privacy law is in force



Build It In



- Embed privacy protective measures into the actual design and infrastructure of any new technology, including RFIDs
- Starting with Privacy Technology Standards



Possible Privacy Solutions



- RFID tags should be deactivated at the point of sale, or when the consumer comes into contact with the tag (e.g., through blocking technology carried by the consumer or pervasive in the vicinity)
- Deactivation at point of sale should be the default, but not without its problems
- Deactivation limits post-sale benefits of RFIDs



Addressing the Challenges of Designing in Privacy



- **Options for Future Designs that address consumer controls (design stage only):**
 - **Zombie Chips designed by RSA**
 - Chips never die, but can be deactivated and then reactivated at a later time
 - Could be switched from non-private to private mode
 - **Smart Blocker Tags designed by RSA**
 - Selective blocking made easy but not likely to be adopted by tag manufacturers



Solution



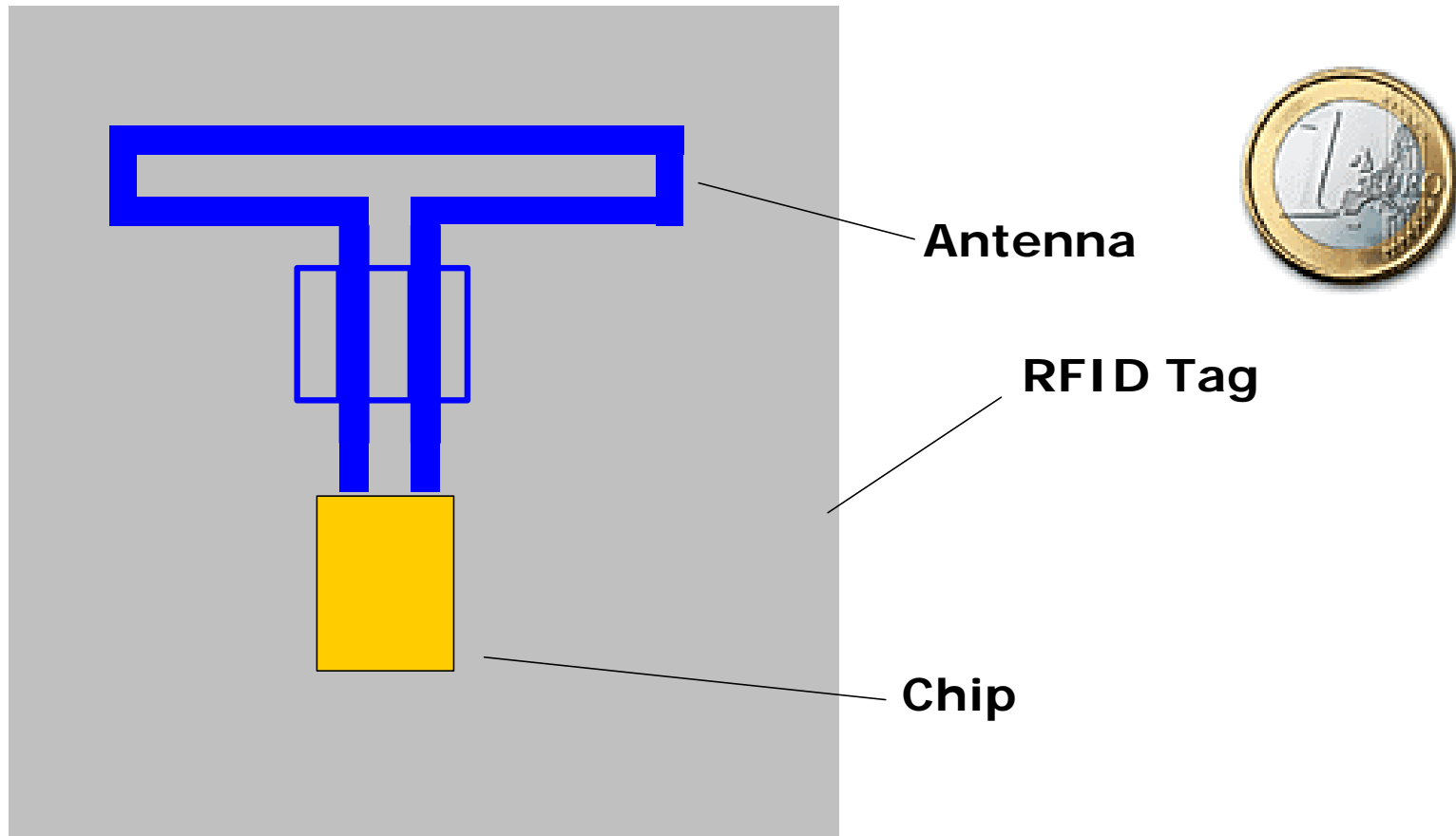
Provide **RFID tag structures** that permit a consumer to decide to disable a tag by mechanically altering the tag in such a way so as to inhibit the ability of a base station or reader to interrogate the RFID tag or transponder by wireless means

- thereby gaining visual confirmation that tag has been deactivated
- unless electromechanical means are undertaken to reactivate it (*).

(*) Such reactivation would require deliberate actions on the part of the owner of the RFID tag to permit the reactivation to take place and could not be undertaken without the owners knowledge unless the item were either stolen or deliberately left unattended.



Example 1: Removable Electrical Conductor



Benefits



- tag deactivation can be performed by the consumer in an **intuitive, reliable, and verifiable way**
 - no “interruption” of flow at checkout counter
- provides **consumer choice**
 - as requested by OECD principles, privacy advocates, and EPCglobal (*)
- allows consumer-controlled after-sales use, warranty checking for example
 - appropriate mechanism to implement **consumer consent**
- vandalism does not become easier than today
 - no e-vandalism !

(*) EPCglobal, Inc.: Guidelines on EPC for Consumer Products, 2003

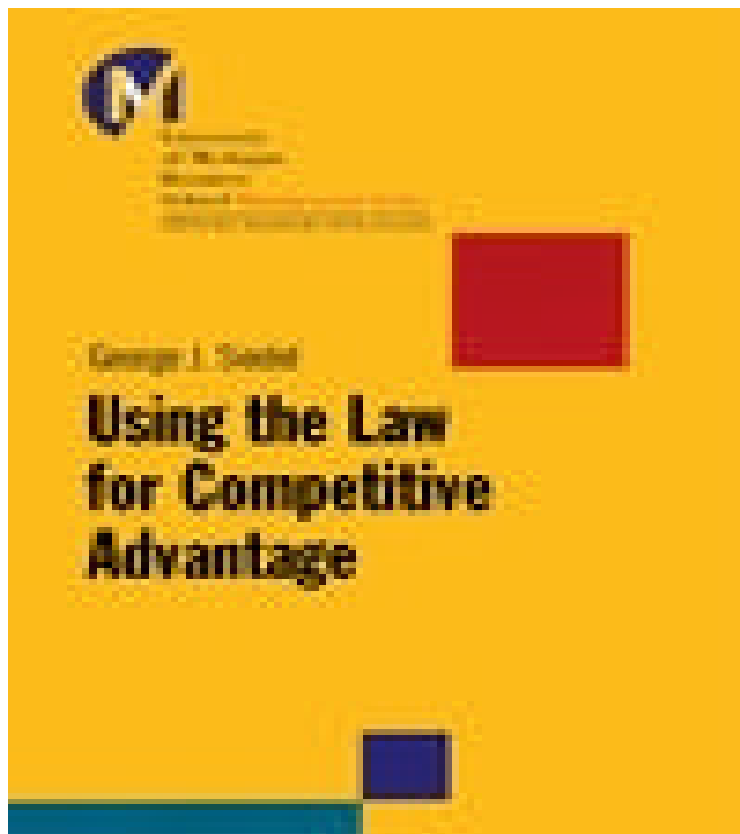


Conclusions



- Many RFID deployments do not presently involve consumers.
- This is the time to address the privacy issues of the mid-term deployments that will involve consumer-specific RFIDs.
- You do not have the luxury of time.
- Act now.





The new privacy paradigm can be seen as an opportunity to gain competitive advantage



To Find out More ...



- The Information and Privacy Commissioner of Ontario has published two RFID papers:
 - *Tag, You're It: Privacy Implications of Radio Frequency Identification (RFID) Technology*, (February 2004)
www.ipc.on.ca/docs/rfid.pdf
 - *Guidelines for Using RFID Tags in Ontario Public Libraries*, (June 2004)
www.ipc.on.ca/docs/rfid-lib.pdf



Discussion of Next Steps



Final Thought



“Nowadays every transaction between corporations and customers must respect the concerns of individuals who want to maintain privacy.”

— Randall, Doug, *Disruptive Scenarios, Four Futures: Privacy Battles and Chatty Networks*, Strategy and Leadership, January 2005



How to Contact Us



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Questions?