

Biometrics and multimodality: Crossing the technology chasm

IFSEC 2011



Agenda

- Introduction to Multimodality

→ *Roland BELY, Product Manager, Biometric Terminals*

- Testimony : Integration of multimodality in a payment solution

→ *Ulrich M. KIPPER, CEO, IT-WERKE*

it-werke

- The first multimodal access control terminal: MorphoAccess® VP

→ *Marie GARMENDIA, VP Sales & Marketing, Biometric Terminals*

Introduction to Multimodality

Roland BELY, Product Manager, Biometric Terminals



Biometric technologies summarized

What for?

- To verify an identity claim **Authentication/Verification**
- To check if someone belongs to a group **Identification**

Applications

- Police, Civilian, Access control, Payment...

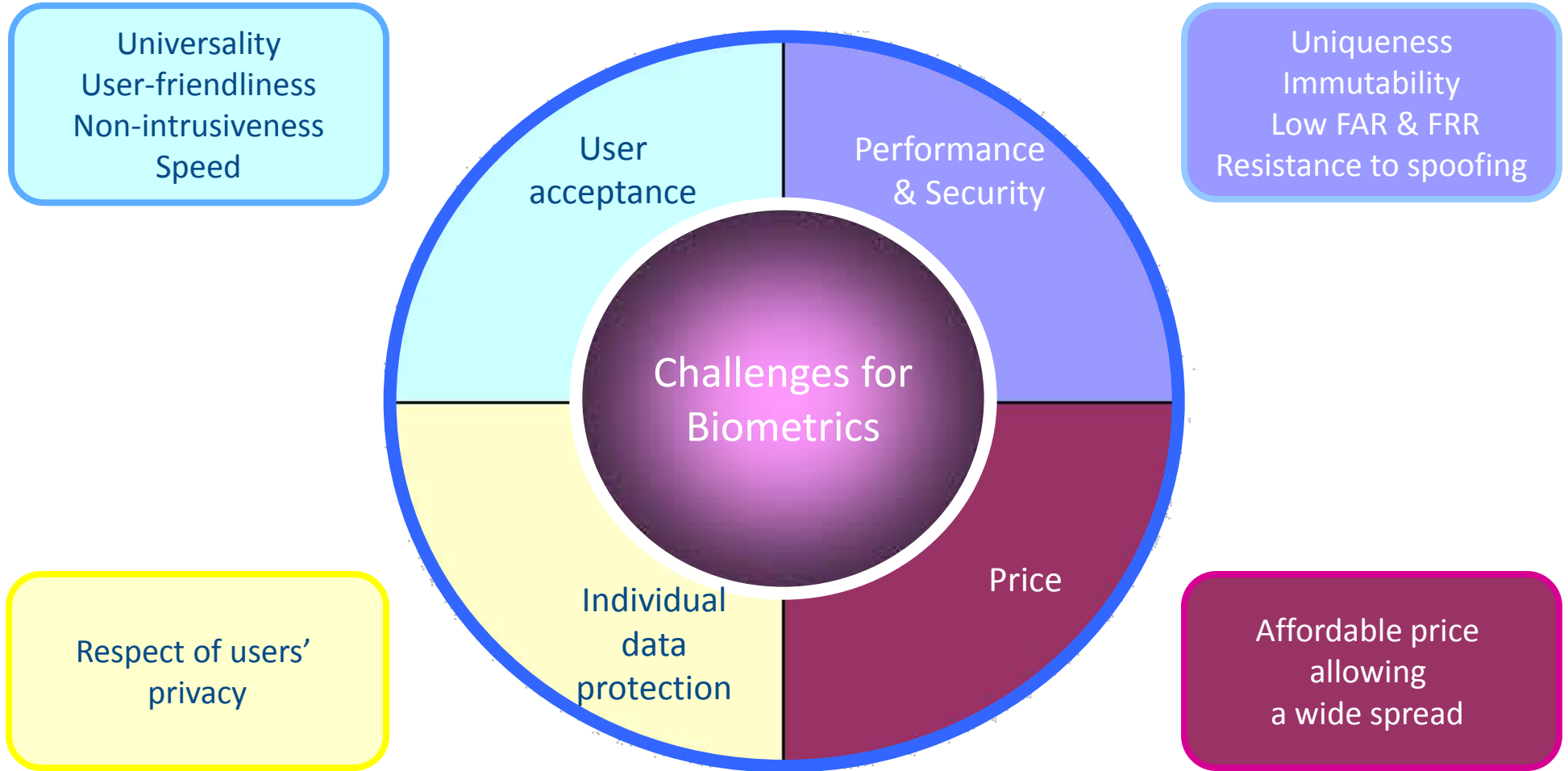
Biometric modalities

- Fingerprint, Iris, Face, Hand geometry, Vein...

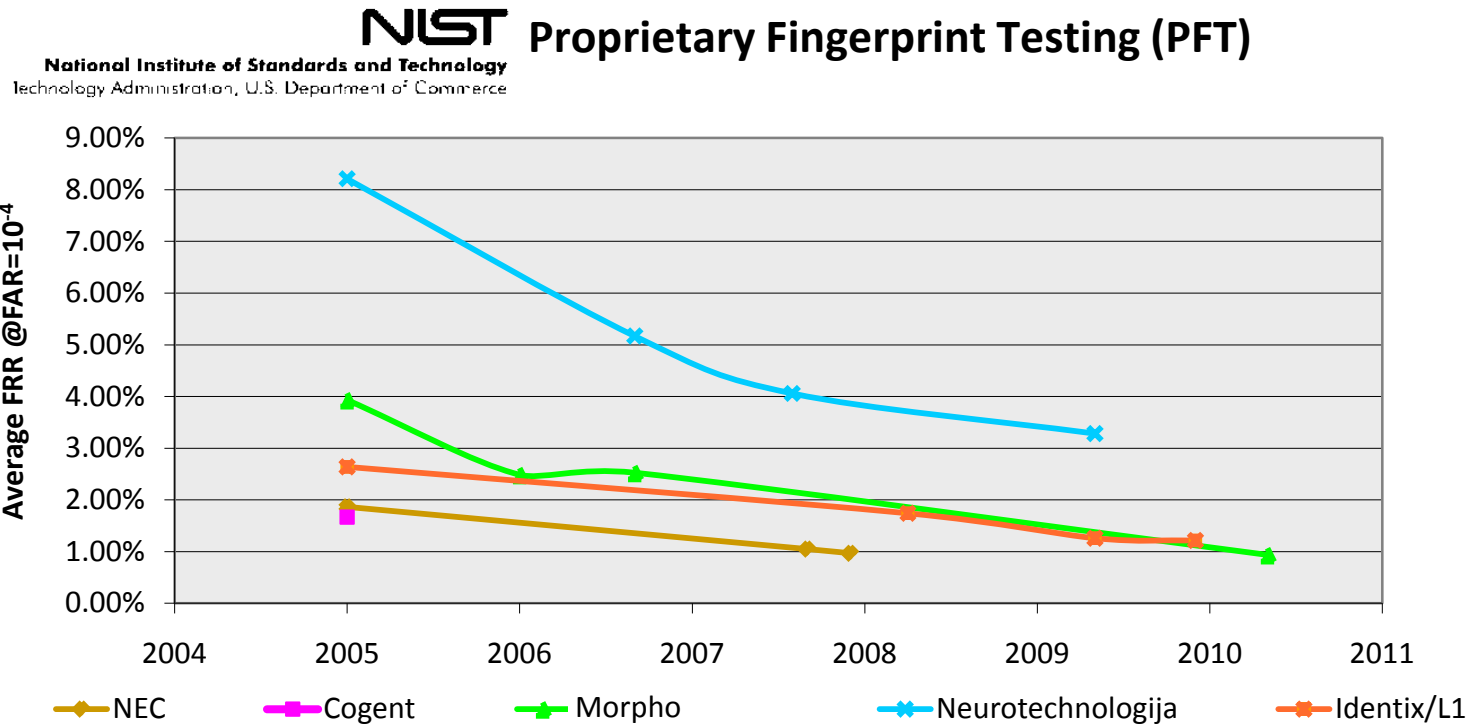
Biometric system typology

- **Mono-modal** One biometrics per individual
(e.g. 1 iris)
- **Multi-biometric** One modality but several biometric samples per individual
(e.g. 2 fingerprints)
- **Multimodal** **One or more samples of different biometrics per individual**
(e.g. 1 finger vein & 1 fingerprint)

Biometric industry challenges

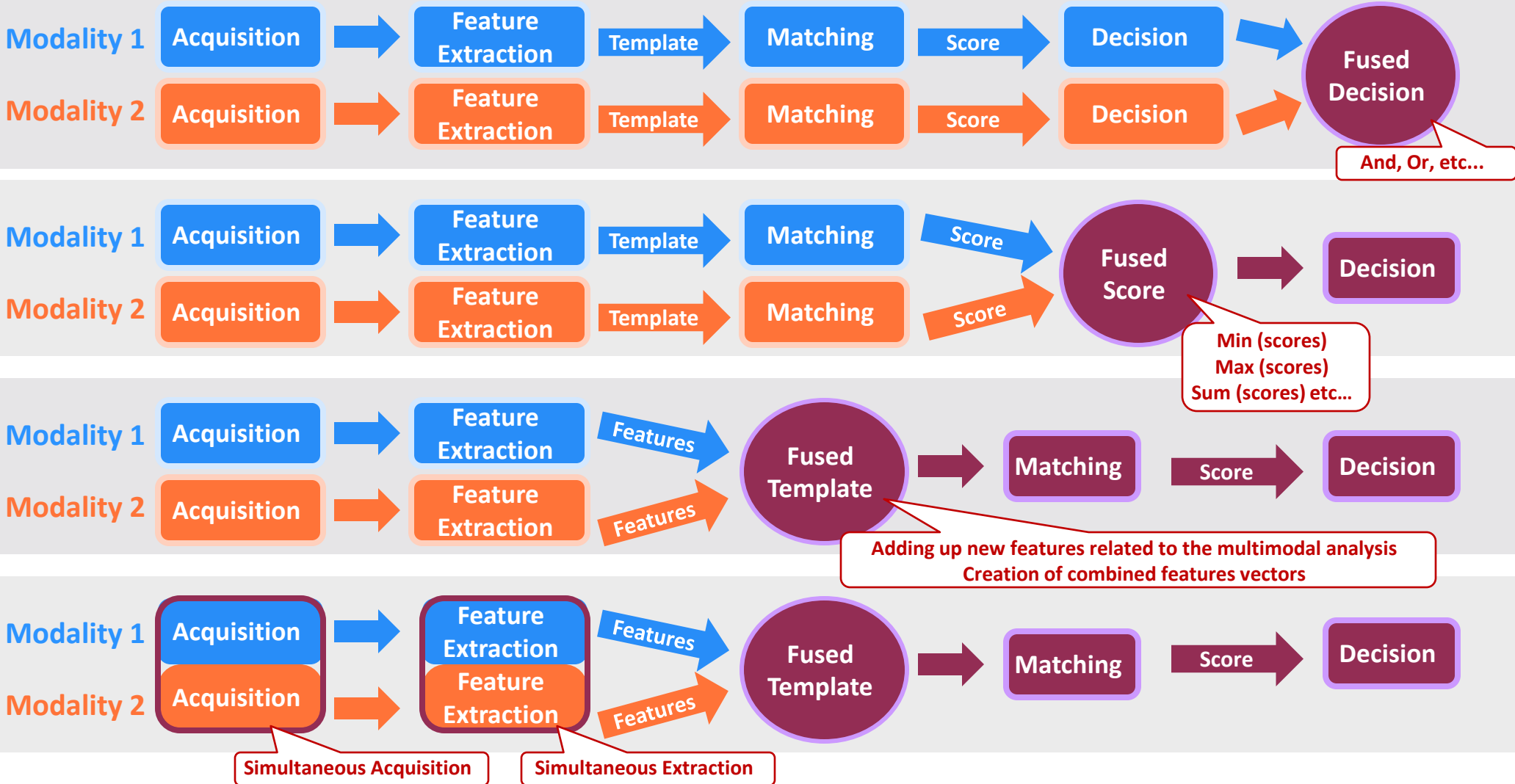


Improvement of performances of a mono-modal biometrics

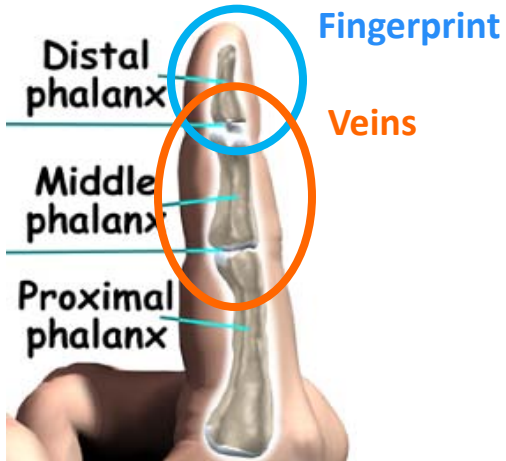
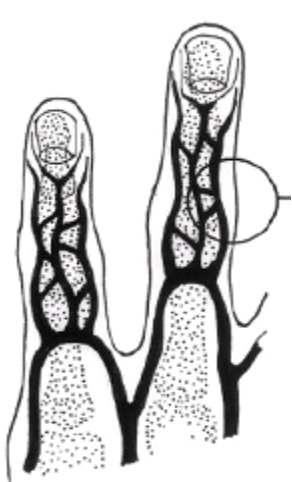


Improving mature technologies is possible but effort/gain metrics are asymptotic and time cycle very important

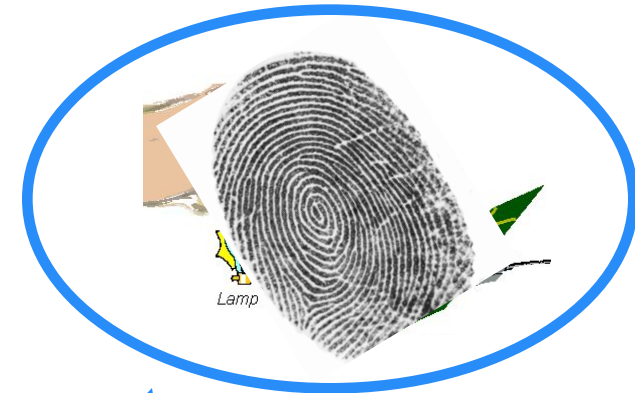
Synoptic of multimodal systems & fusion schemes



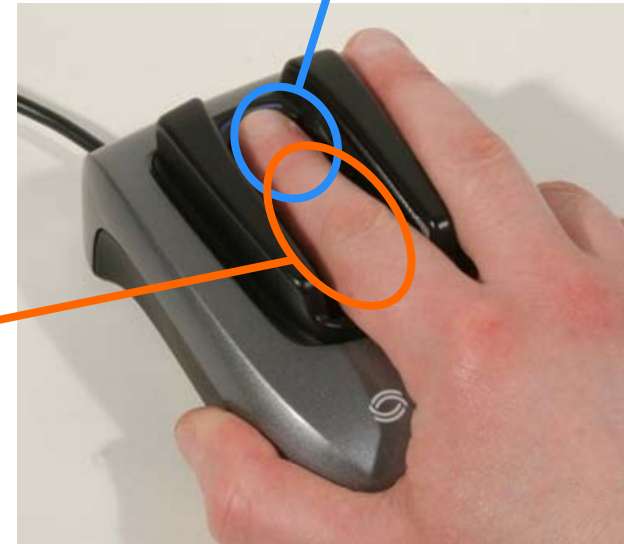
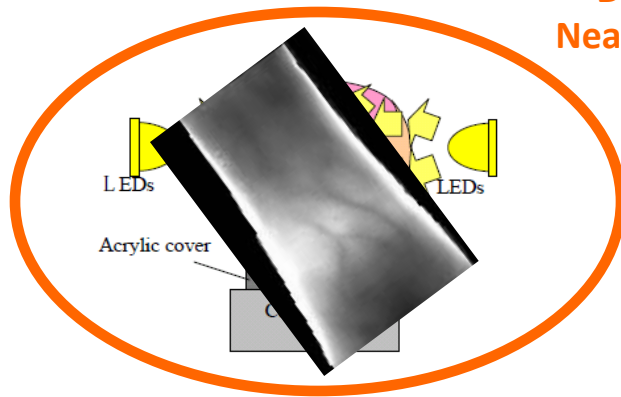
FINGER VP: a finger vein & fingerprint multimodal solution



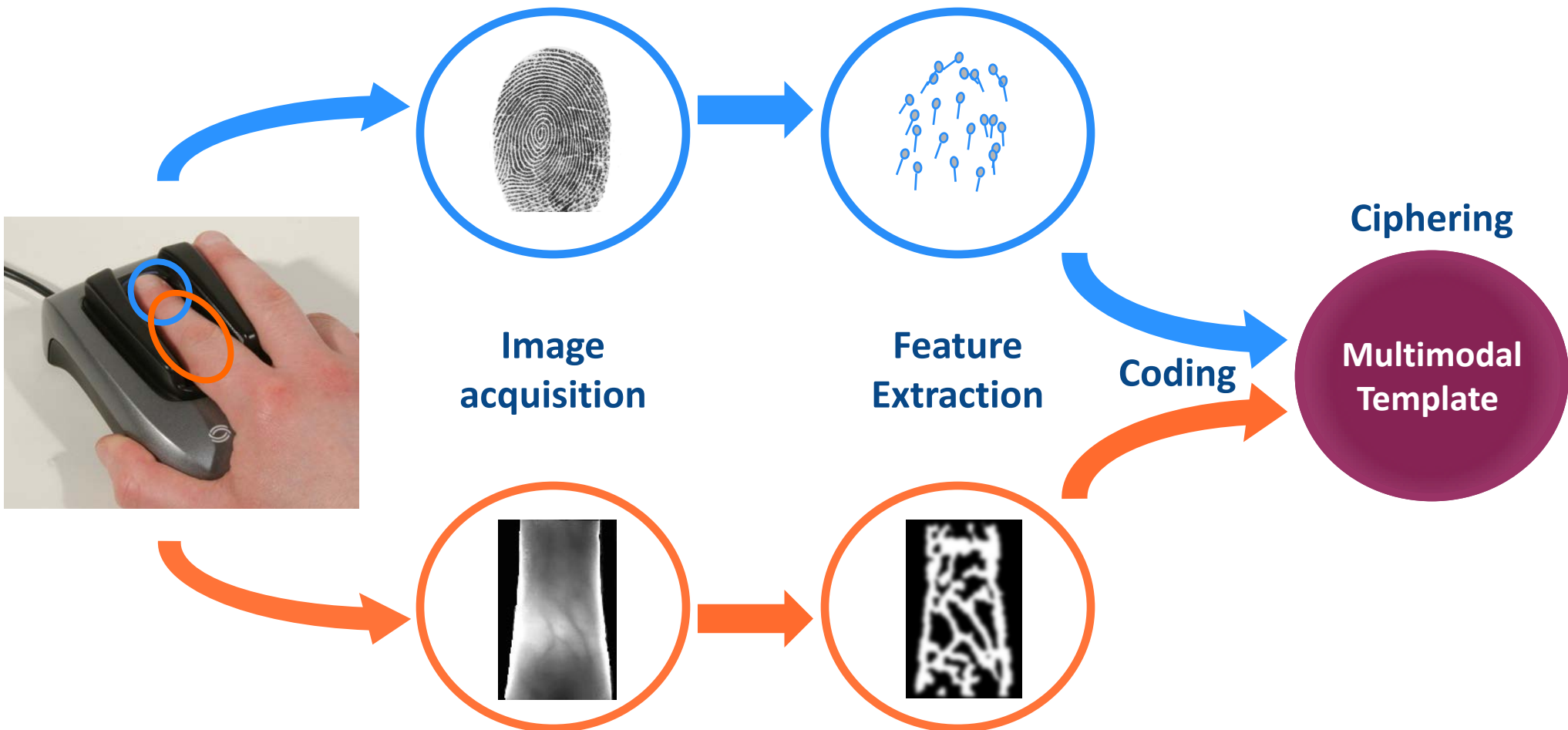
Optical capture by
Total Reflection using
Visible Light



Optical capture by
Direct View using
Near Infra Red Light



FINGER VP technology: fusion scheme



Two modalities ideally suited for fusion

The 2 biometrics are mature and above all independent, enabling an efficient fusion

Same ergonomics and ease of use as for fingerprint alone are reproduced

Simultaneous acquisition is achieved using mastered technological principles

FINGER VP



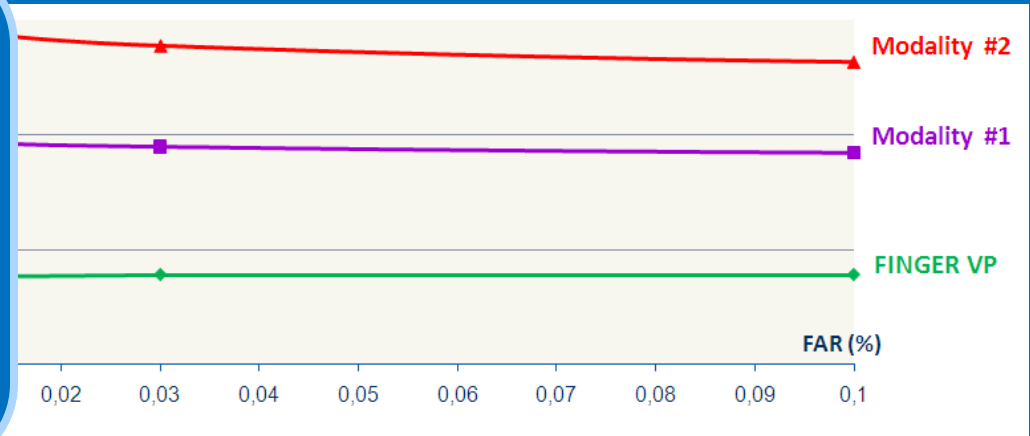
The processing of the two biometrics doesn't require more resources than in a mono-modal device

The multimodal template size is much smaller than 1KByte

Authentication and Identification with large databases are available

The key assets of a cutting edge technology

Successful enrollment is guaranteed, particularly for individuals who experience difficulties with mono-modal devices, with the same simplicity and ease of use as for fingerprints alone

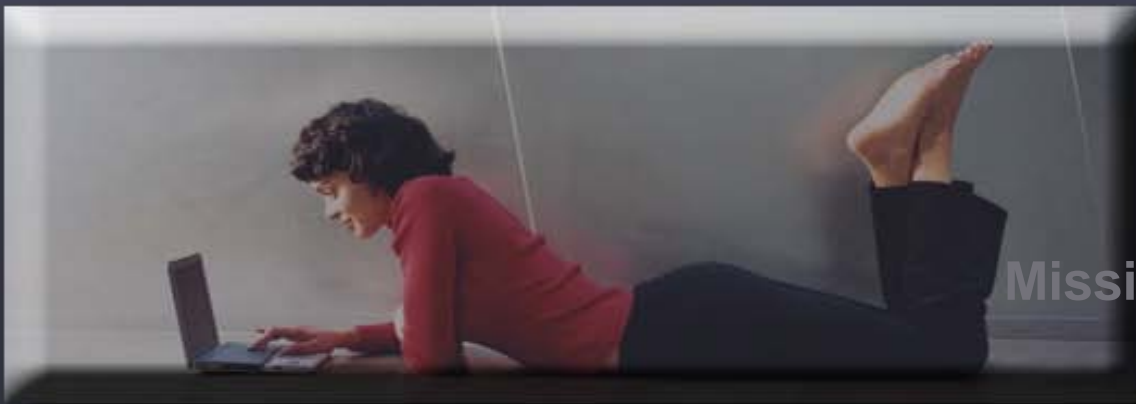


- @ $FAR=10^{-4}$, FRR is 10 times lower than the one of the best modality
- FINGER VP allows the recognition of candidates that would have been

FINGER VP combines the protection mechanisms intrinsic to each technology and also makes the most of the new characteristics resulting from the fusion

The Ultimate Solution for Security, Accuracy and Performance





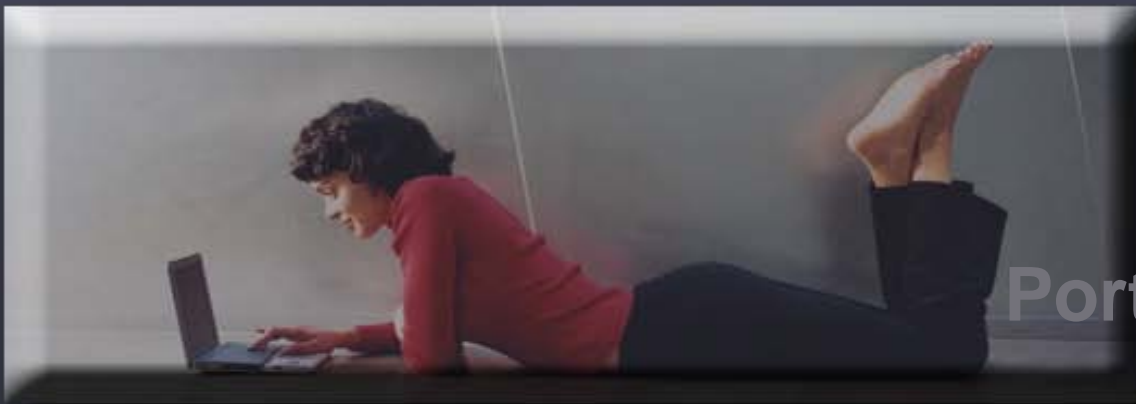
Striving for our customers success

Testimony : Integration of multimodality in a payment solution

Ulrich M. Kipper

CEO
it-werke group

it-werke



it-werke

Since 1999

Development of Biometric Convenience Applications (BCA)

Biometric Solutions

- Process Authorisation
- Login / ID-Check
- Access Control / Time Attendance
- Payment / Loyalty / CRM

Market Leader

90% of BCA on German market are made by it-werke



History – Success-Story



- 1999 First reflections on biometric access control / authorisation
- 2000 start biometric payment project
- 2003 first payment by fingerprint in Germany
- 2004 early adopters : hotels, restaurants, small Retail
- 2005 EDEKA first large retailer to use biometric payment
- 2006 virtual loyalty card – biometrics go green – fingertip instead of plastic
- 2007 Biometrics goes prepaid – school and canteens
- 2008 Biometrics goes smart – itw- adds business intelligence tools :
who buys what, where, how much – know your customers preferences?
- 2009 Biometrics become standard for retail. EDEKA, Globus, Bartels & Langnes, METRO, real.-,
Albert Heijn, Rewe, Dole etc.
1000th installation of a it-werke biometric system.
- 2010 VINGADO Multibiometrics, SEPA, Security Controller, Login Systeme



it-werke
more than technology



Awards and Distinctions

- Entrepreneur with ideas 2003 – Magazine: „Geldidee“
- Gastro Innovation Price 2004 – DEHOGA
- Entrepreneur of the Year 2004 – Magazine: „Business in Baden“
- CyberOne Award 2004 - it-werke amongst 5 most innovative firms in B-W
- Innovation Price 2007 CRM – Initiative Mittelstand
- gap due to busy working 😊
- **Boccia Award 2010 – Best Business Customer Interaction**
- **European Retail Technology Award 2011 – Best Customer Experience**



VINGADO experience

VINGADO payment application

introduced 10/11
in Equens canteen in Utrecht

First
Multibiometric
Payment System
Worldwide





VINGADO Registration

Registration

incl. mandate etc

VINGADO
ASSURANCE WITH A SIMPLY EASY

Enroll vein finger prints Personnel Select relay

Personnel

Title

Sex Male

First name Erwin

Last name Wagesow

Birthday 05 02 1982

Contact

Email

Phone number

Address

Street and Number

ZIP code

Town

Country code DE

PIN code entry

PIN ****

Back Next OK Cancel

Template



Scan



Template 600 Byte

01001111101010101000001

Name, Address



persal data
- encrypted -

Transaction data



IBAN / BIC
- encrypted -



VINGADO Privacy

Triple Base Concept



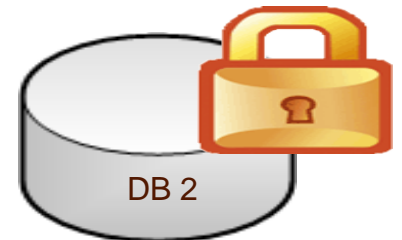
DB 1

Biometric Data
Templates
- encrypted -



DB 2

Personal Data
- encrypted -



DB 3

Transaction Data
- encrypted -

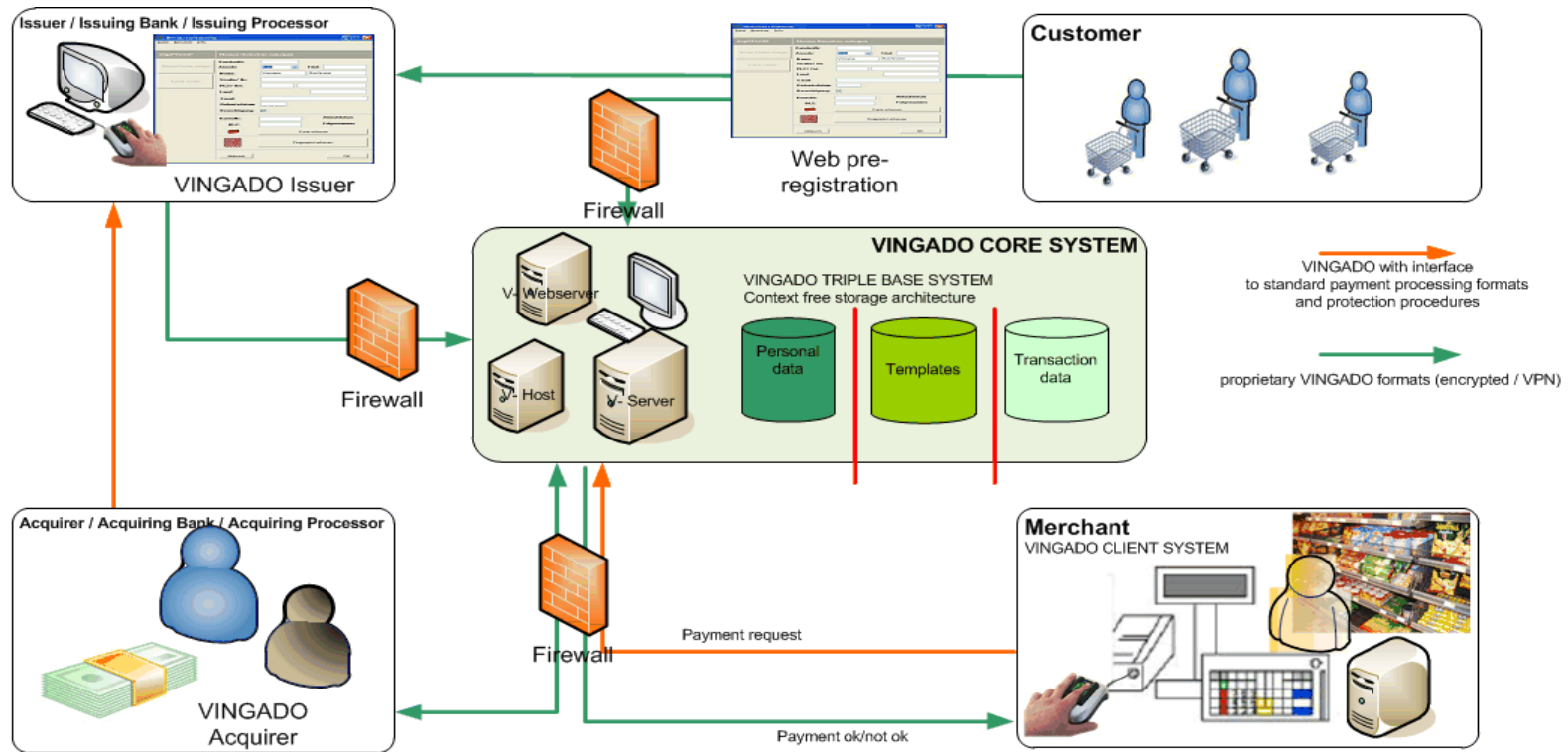


Context Free
Data Storage

Maximum Privacy

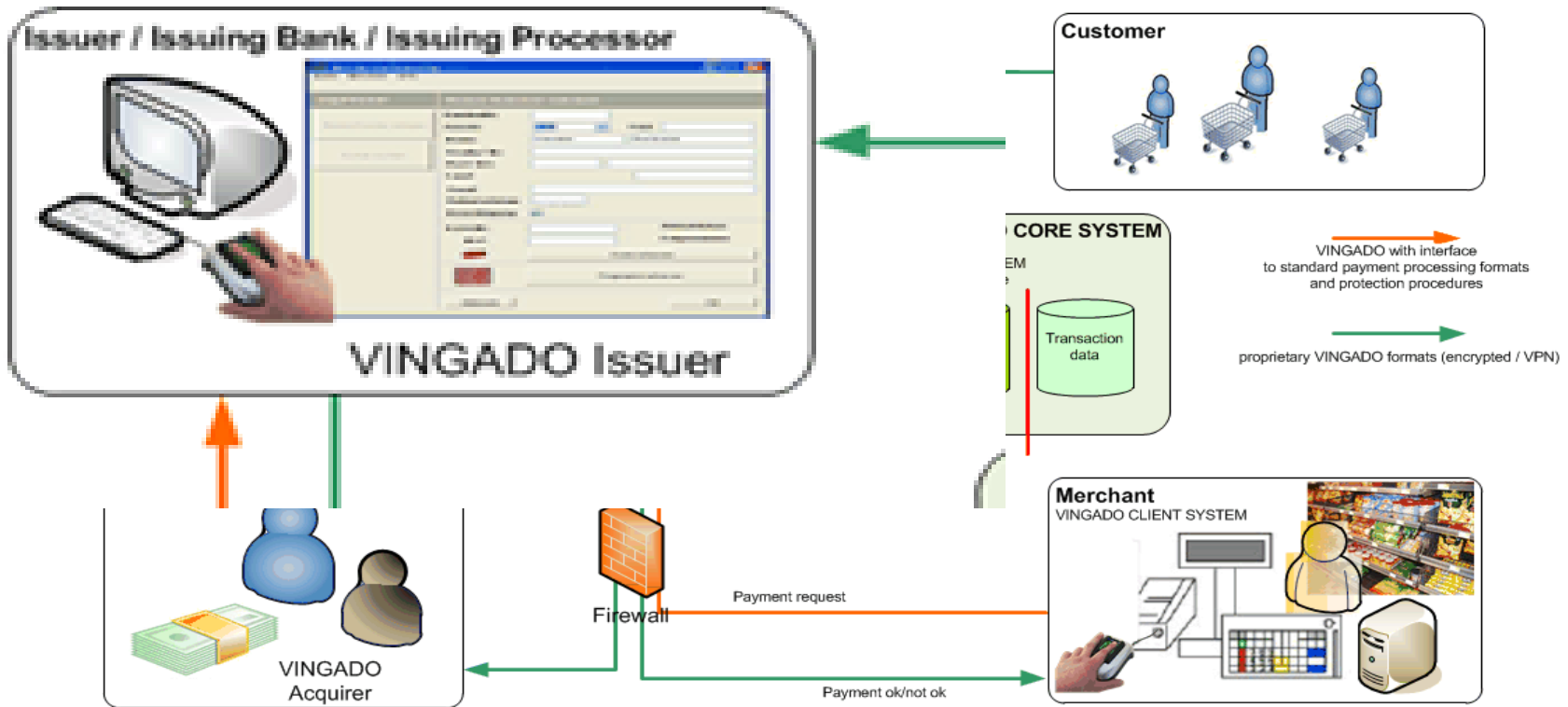


VINGADO Architecture



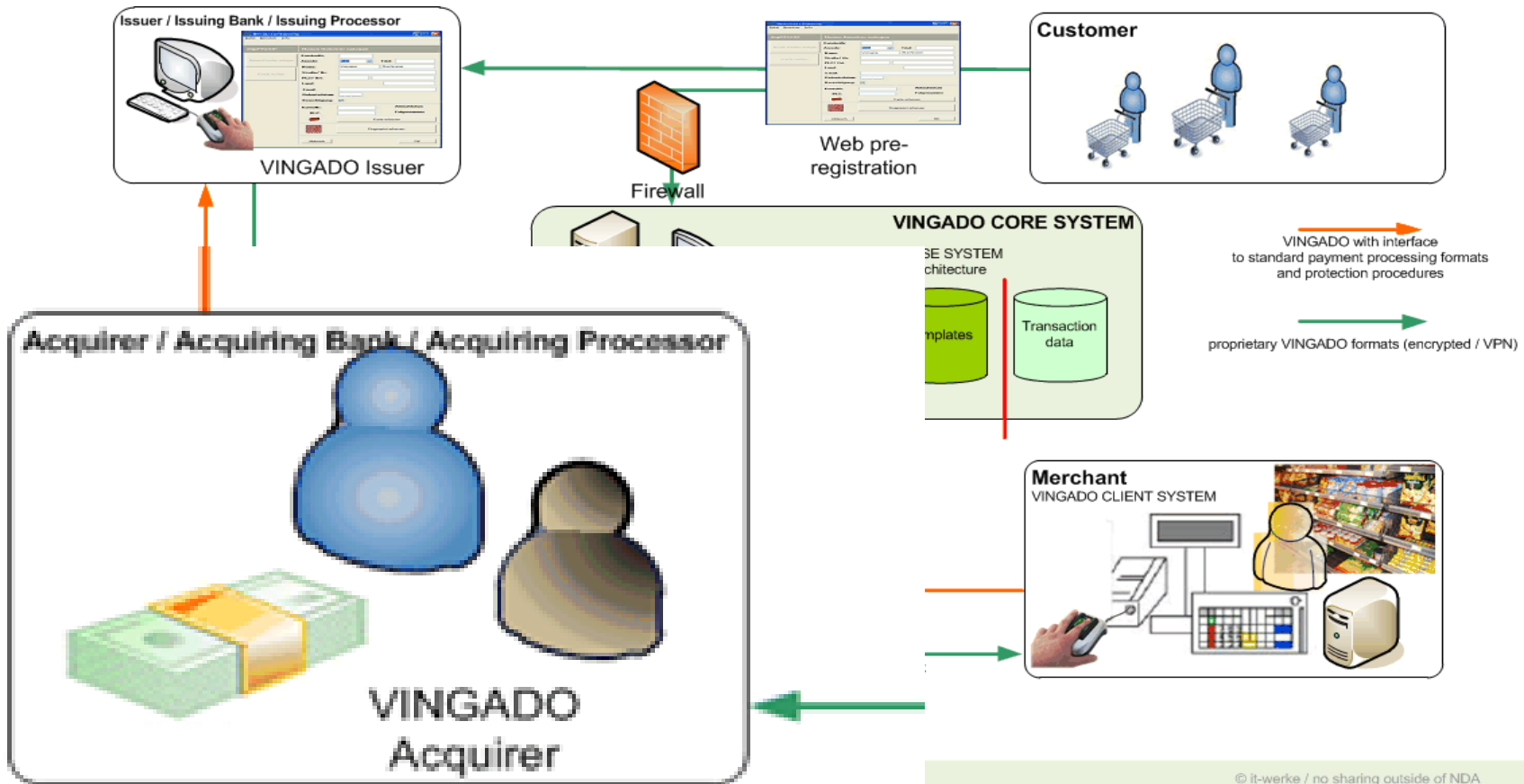


VINGADO Partner





VINGADO Partner





win win VINGADO

Acceptance

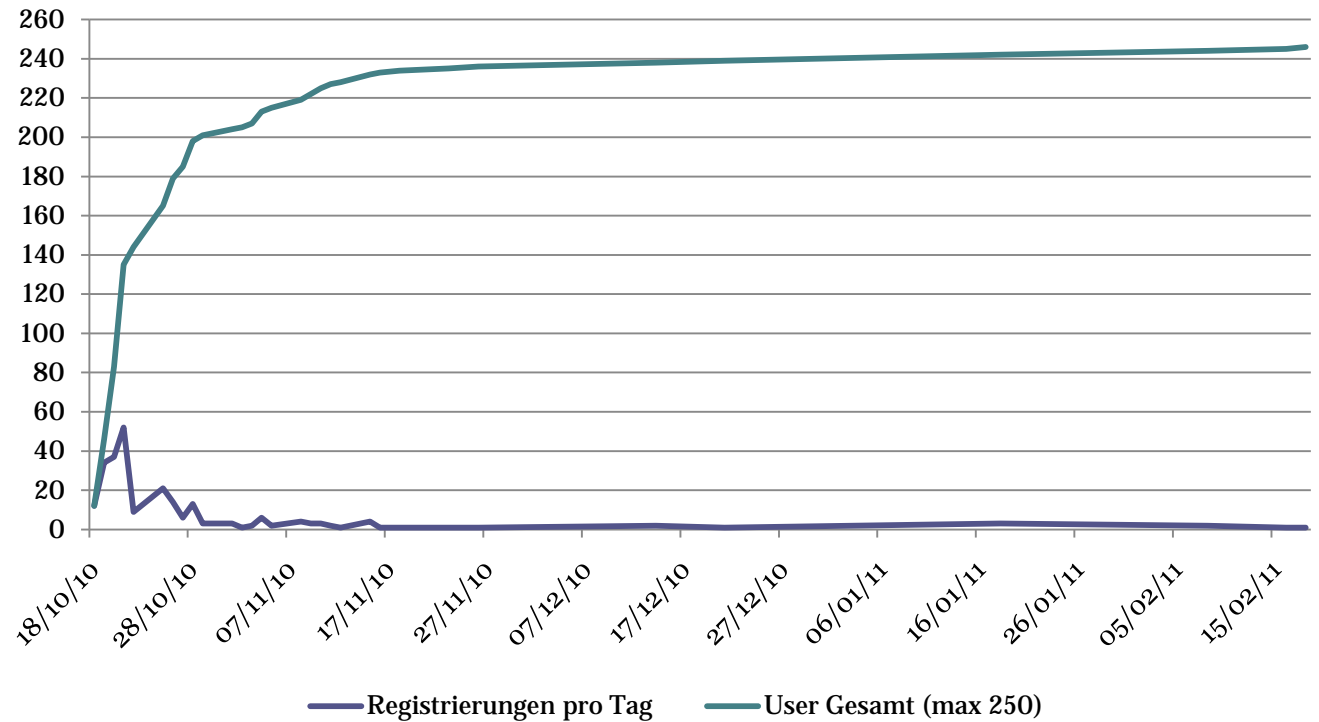
:-)

foreseen

sample size 250

voluntary basis

full within 2 weeks



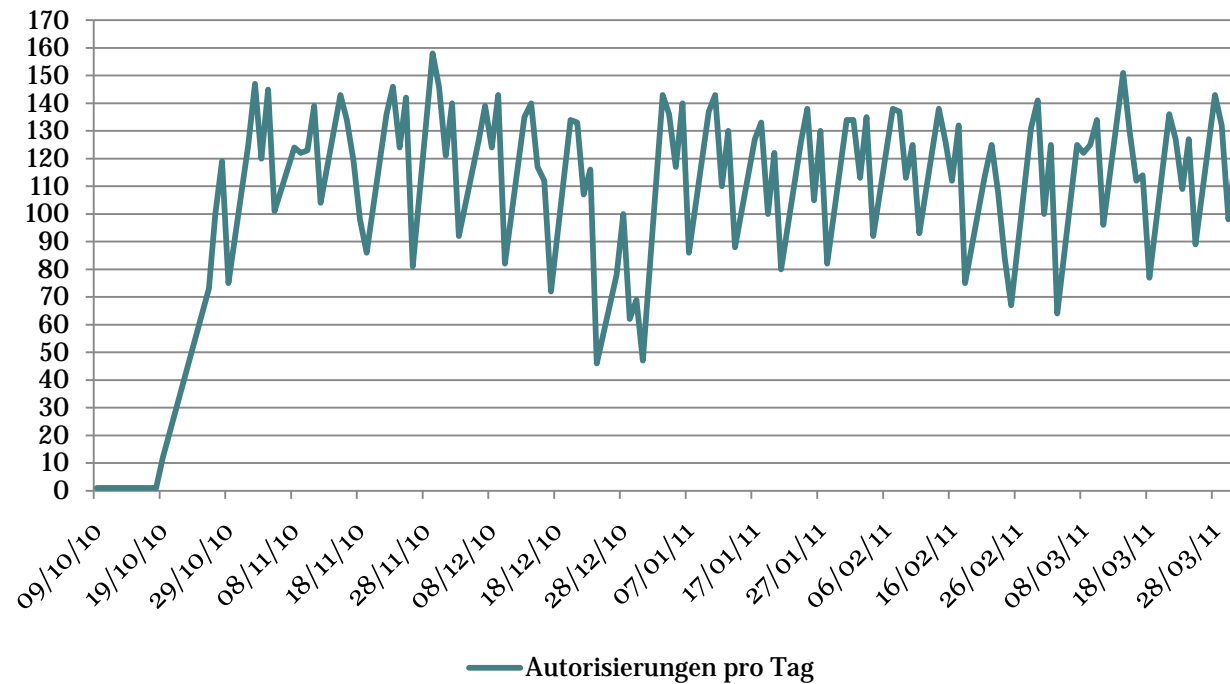


VINGADO Statistics

Utilization

Transaktionen
9.10.10 bis 31.03.11
n = 13076

Autorisations per Day



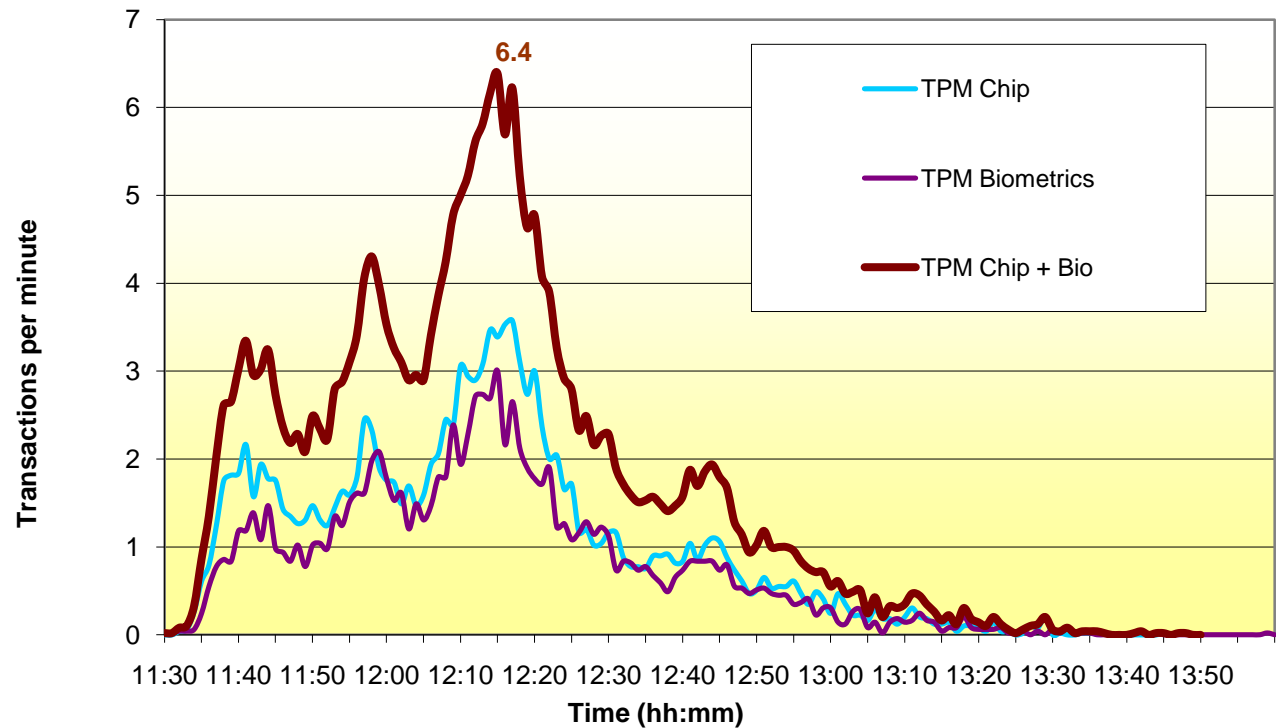


VINGADO Statistics

Transactions

distribution over time

Biometrics & Chip (Transactions per minute over 4 registers)



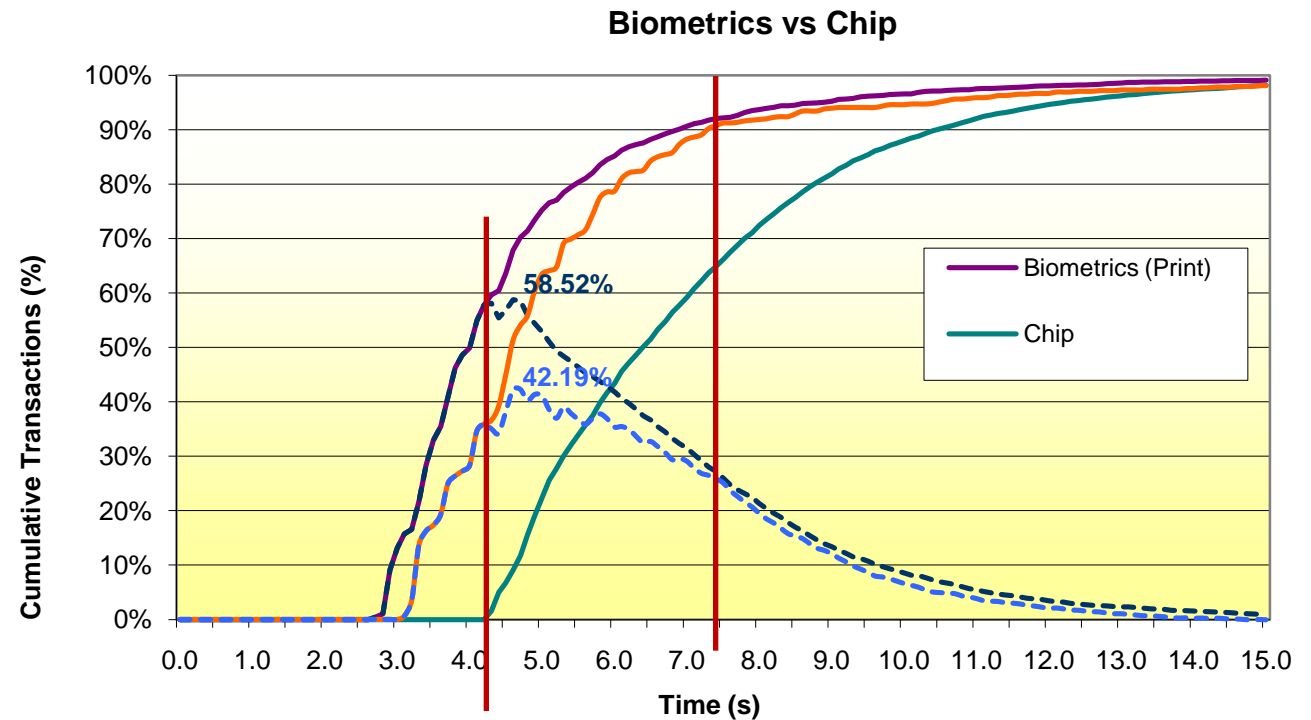


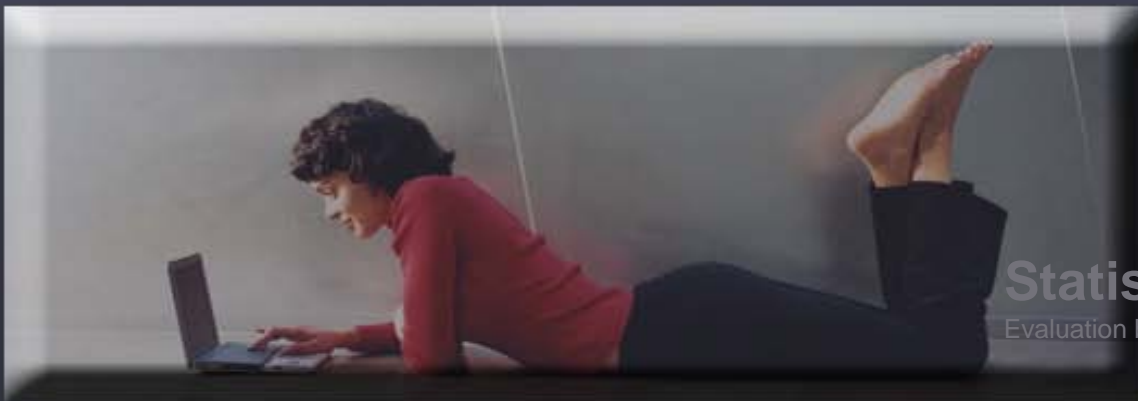
VINGADO 3 seconds ahead

Speed

58,5% of biometric payments are terminate before the first chip payment.

After 7,5 sec 90% of all biometric payments are finished (65% of chip payments)



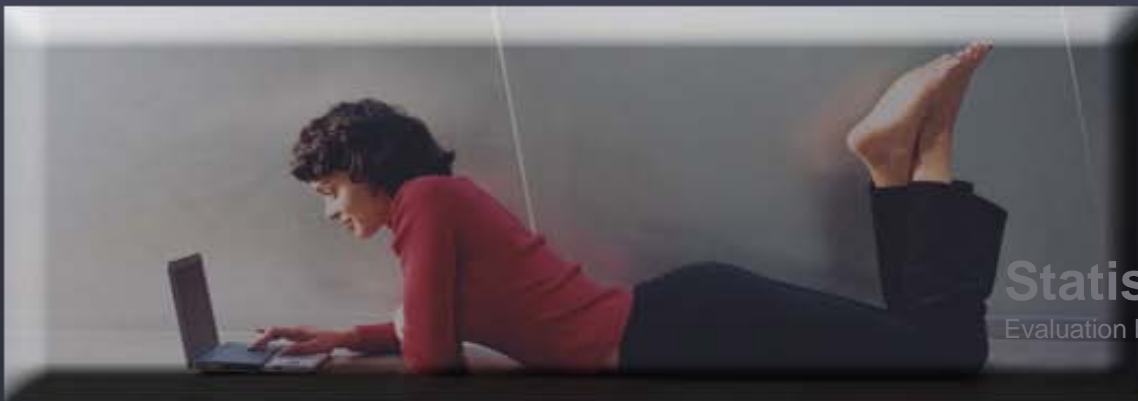


Statistics

Evaluation by Fraunhofer

Usage

How often did you use the biometric payment solution, when you visited the cafeteria?			
	n	%	
frequent: regularly and often	177	86,8	
rarely: regularly but not often	13	6,4	
increasing: first not as often, then more often	-	-	
decreasing: first regularly and often, then rarely	5	2,5	
no more: first regularly/irregularly, then no more	9	4,4	
N	204	100	



Statistics
Evaluation by Fraunhofer

Satisfaction

How satisfied are you with the biometric payment solution?

	in general		registration process		user-friendliness		speed		SEPA direct debit	
	n	%	n	%	n	%	n	%	n	%
very satisfied	120	58,3	62	30,1	127	62,0	140	68,0	24	11,8
satisfied	82	39,8	131	63,6	73	35,6	54	26,2	80	39,4
not so satisfied	3	1,5	9	4,4	5	2,4	10	4,9	58	28,6
dissatisfied	1	0,5	4	1,9			2	1,0	41	20,2
N	206	100	206	100	205	100	206	100	203	100

The first multimodal access control terminal: MorphoAccess[®] VP

Marie GARMENDIA, VP Sales & Marketing, Biometric Terminals



The ultimate solution for Security, Accuracy and Performance





Technology rewarded at
Security Innovation Awards
Essen 2010

MorphoAccess® VP Series



MorphoAccess® VP Product Offer



 VP-Bio	 VP-Dual
---	--

Authentication	No	Yes
Identification	Yes	Yes
P/N	293586156	293585753
DB capacity	5K users upgradable to 10K users(*)	5K users upgradable to 10K users(*)
Smartcard reader	No	MIFARE®/DESFire®

(*) MA_10K USERS License required

FEATURES

The assets of FINGER VP Technology

- Universal
- Easy-to-adopt
- High accuracy
- Excellent trade-off between security and comfort of use
- Anti-spoofing features

An inventive design

- High quality finishing
- Ergonomic (finger detection)
- Weatherproof (IP65)
- Robust



Best-in-class features

- FBI PIV IQS optical sensor
- MINEX compliant FP algorithms
- Identification with large database (5K users upgradable to 10K)
- Security protections

Practicality at installation

- Easy wall mounting
- Easy connection
 - POE on RJ45
 - Wi-Fi option



■ Performances are directly inherited from FINGER VP module

- **Usability:** FTE rate is close to the product of the two mono-modal FTE (on device enrollment)
- **Accuracy:** @ FAR=10⁻⁴, FINGER VP's FRR is 10 times lower than the one of the best modality
- **Recognition Time:**

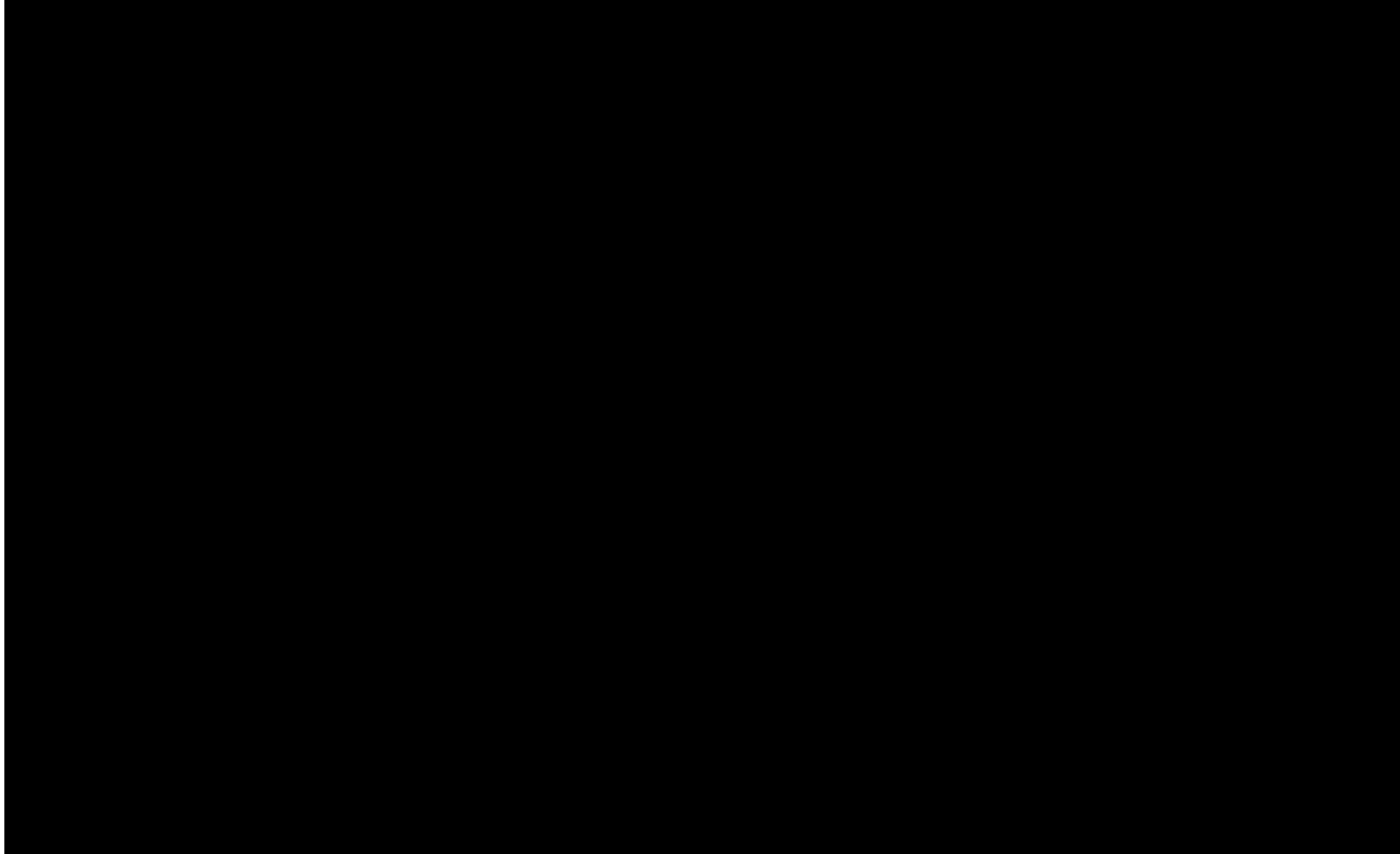
1:1(*)	1s
1:500	1s
1:5000	1.5s

All values are typical

() doesn't include badge reading time, still to be assessed*



USAGE



To be continued....

Visit us on booth 4/D110

