

FIECE

National Centre for Flexible Electronics



Call for Expression of Interest For NFC Enabled Flexible Smart Tags

24th August 2015

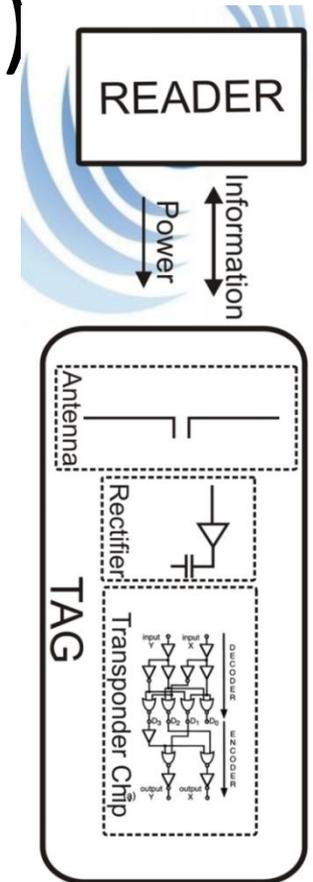


<http://www.smartcardalliance.org/>

Background

Near Field Communication (NFC)

- Short-range wireless communication between two devices
- A special RFID device, working on 13.56 MHz frequency (free)
- Low-powered tag → Does not need battery
- Becoming a standard application in hand-held devices (e.g. mobile phones)
- **Next big thing (Internet of Things, payment, brand protection etc.)**



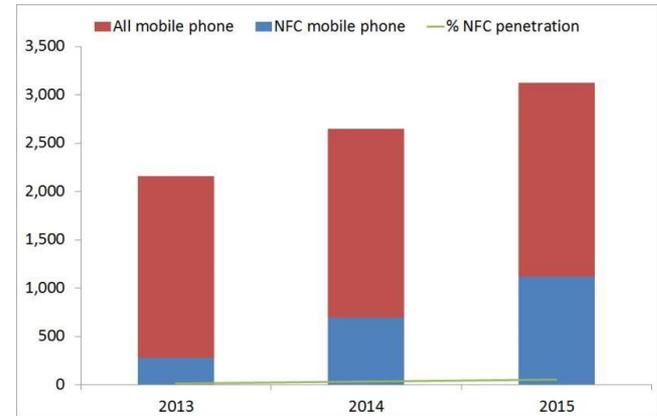
The NFC Eco System



<http://www.rfidworld.ca>

Market Size and Potential

- NFC technology has the potential to revolutionize mobile payments, train ticketing and other applications owing to growing adoption of smart phones
- The percentage of mobile phones with NFC is increasing



Source: IDTechEX

NFC market is projected to reach USD 20B by 2019

Transparency Market research

Cost of CMOS Based Rigid Tags

Aspect	NFC	Bluetooth	Bluetooth Low Energy
Tag requires power	No	Yes	Yes
Cost of Tag	\$0.10 USD	\$5.00 USD	\$5.00 USD
RFID compatible	ISO 18000-3	active	active
Standardisation body	ISO/IEC	Bluetooth SIG	Bluetooth SIG
Network Standard	ISO 13157 etc.	IEEE 802.15.1	IEEE 802.15.1
Network Type	Point-to-point	WPAN	WPAN
Cryptography	not with RFID	available	available
Range	< 20 cm	~100 m (class 1)	~50 m
Frequency	13.56 MHz	2.4–2.5 GHz	2.4–2.5 GHz
Bit rate	424 kbit/s	2.1 Mbit/s	1 Mbit/s
Set-up time	< 0.1 s	< 6 s	< 0.006 s
Current consumption	< 15mA (read)	varies with class	< 15 mA (read and transmit)

https://en.wikipedia.org/wiki/Near_field_communication

Challenges – India Specific

- Typically NFC ICs are fabricated in expensive CMOS fabs
 - **Not available in India** → Need of an alternative technology
- **Need of substantially large consumer market for a viable business case**
 - Need to recognize India specific applications
- **Need to develop an alternative, low-cost Circuit fabrication process with sufficient yield**

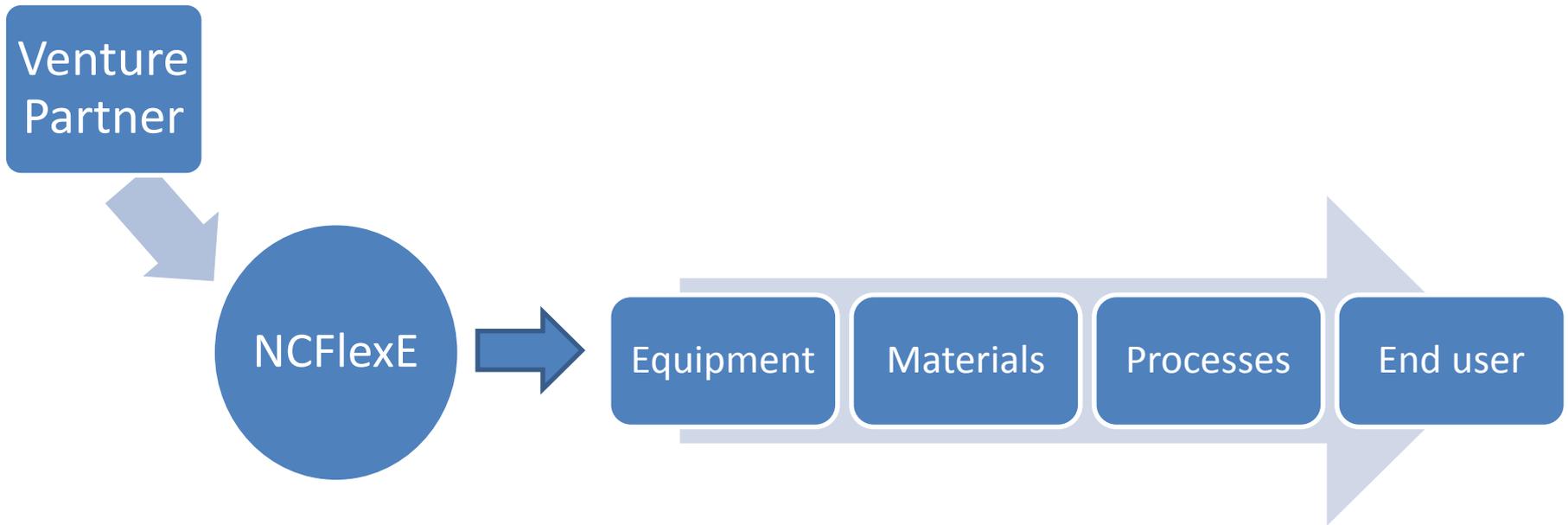
Proposed Solution

- FlexE Centre is developing a low-cost and high performance metal-oxide thin-film transistor based NFC Tags
- Our technology will be compatible with low-cost polymer substrates and hence has the potential to be much cheaper than CMOS based Ics
- Low-cost flexible NFC tags would enable applications where flexibility, light weight, and mechanical robustness is important, e.g. NFC enabled cards, sensor read-out, packaging, brand protection etc.

Advantages of proposed solution

- Compatible with polymer substrates
 - **Flexible/conformable**
 - **Cheaper**
 - Lighter
 - Shatter-proof
- Will be fully **made in India**
- Verification is at the hands of the user
- Does not require special or complex detection

Call for Partners



- ✓ We are seeking partners across the value chain shown above
- ✓ We are looking for partners to enable the scaling and manufacturability of the developed processes
- ✓ Preferential terms for early partners

Contact Information

<p>Dr. Sudhindra Tatti Chief Operating Officer, National Centre for Flexible Electronics, Indian Institute of Technology Kanpur. statti@iitk.ac.in</p>	<p>Prof. Monica Katiyar Co-ordinator, National Centre for Flexible Electronics, Indian Institute of Technology Kanpur. mk@iitk.ac.in</p>
--	--

Also visit our webpage for more details on partnership models and other technology domains: www.ncflexe.in