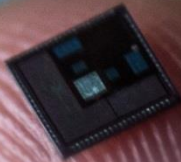




*We help ideas
meet the real
world*



DELTA Microelectronic

**Microchip for every industry
– ‘Make more with less’**

.....
DELTA / RFID

We help ideas meet the real world / ASIC.MADEBYDELTA.COM

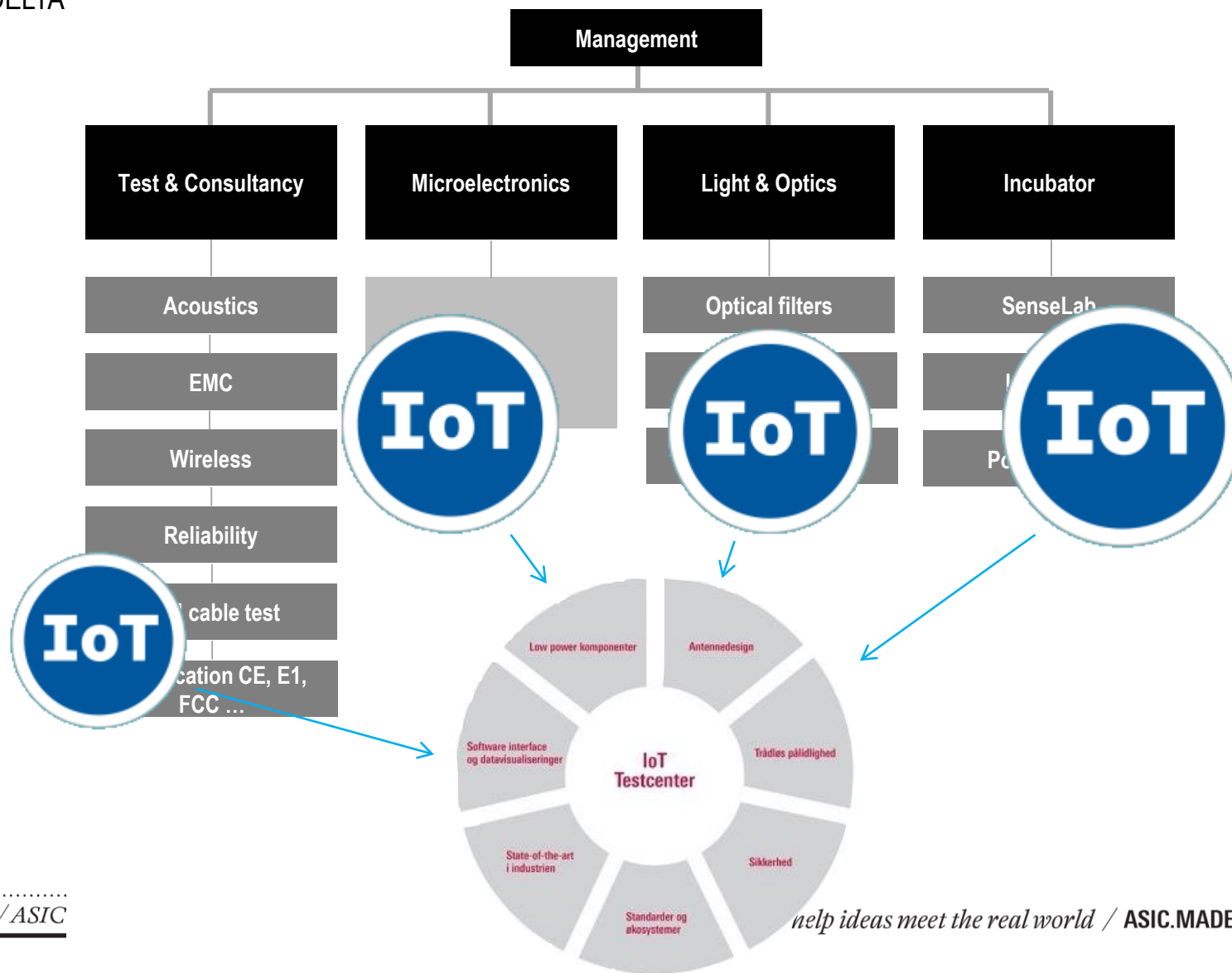
*We help ideas
meet the real
world*

Agenda

- *) DELTA microelectronics and IOT
- *) Focus on Sensors
- *) Battery less Wireless bridge for Sensor Capture
- *) IOT is not only wearables
- *) Examples of IOT products
- *) Conclusions

Organisation

DELTA



Gert Jørgensen

VP Sales & Marketing



- Worked at DELTA since 1982 (34 years)
- Worked as test engineer, DSP solutions , quality assurance, project manager and Sales
- Business development driver, personally turned DELTA from consultancy company to component supplier
- Helps major customers to drive innovations and technology intros
- Vice President for Sales & Marketing since 2010

DELTA Microelectronics



History & Highlights

Services

- 1976 ME test activities starts, RAM, PROM & CPUs
- 1984 ASIC design center established
- 1992 First space components delivered
- 1999 OEM supplier
- 2001 Order of 600,000 DSRC chips

Turnkey

- 2002 RF test center starts
- 2004 First 10 mill components delivered
- 2008 Single contract of 10 mill chips
- 2009 25th anniversary: ASIC design
From hand-drawn chips to nanotechnology and DSRC
- 2010 IBM partnership contract
- 2011 Celebrates more than 100 mill components delivered
- 2012 GlobalFoundries partnership contract
- 2015 First projects for real IOT applications starts

Since 1976

test experience

Since 1984

design experience

69

employees in
Microelectronics

+100

tailor-made ICs

+500

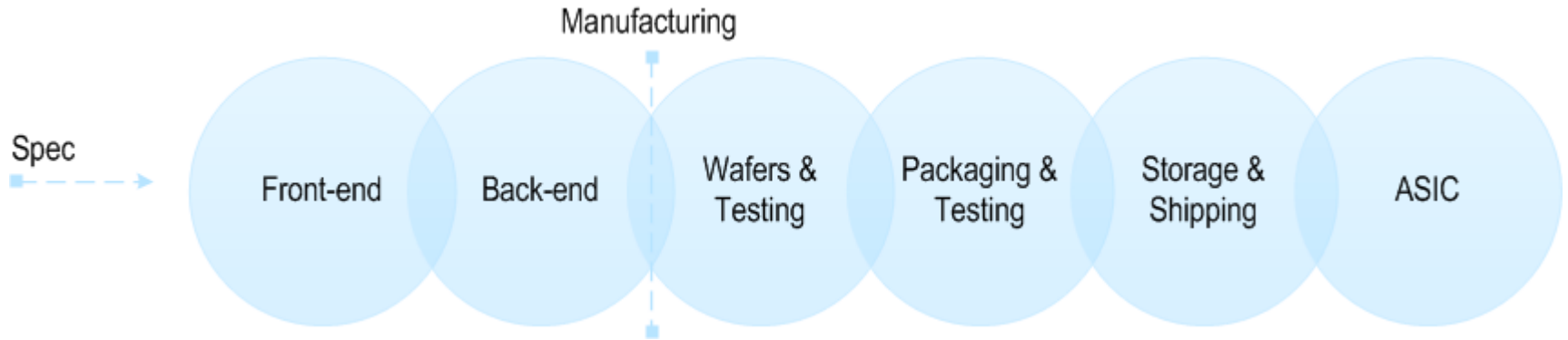
man years' experience

+1000

test programs

DELTA Microelectronics offers

One Stop Shop - Predictable path to success



DELTA can provide:

- From specification / GDSII to silicon – wafer or packaged
- ASIC design and IPs
- Package design and evaluation
- Wafer and component test
- Bumping and packaging in the Far East
- Storage and dedicated logistics team
- Supply chain management

Microelectronics & IOT Focus areas

4 focus areas within ASIC turnkey solutions

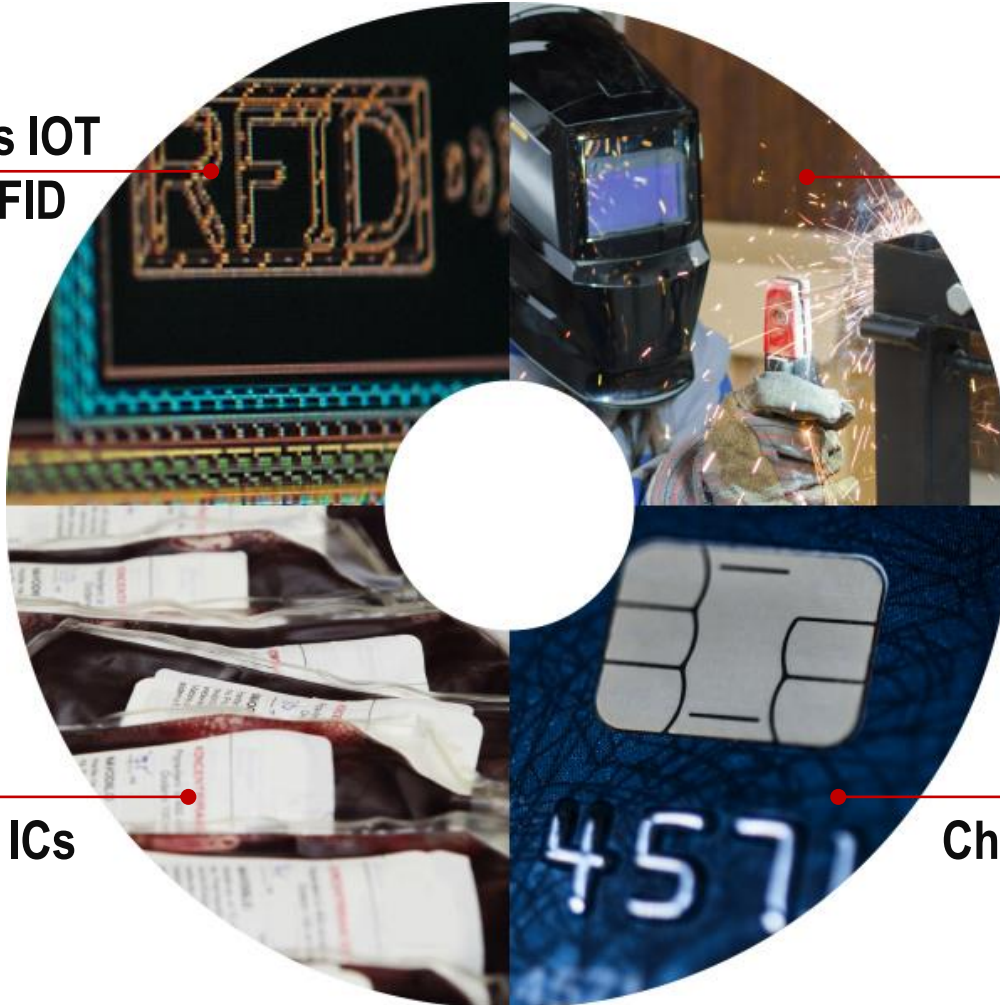


**Wireless IOT
using RFID**

**Optical chip
solutions**

Medical ICs

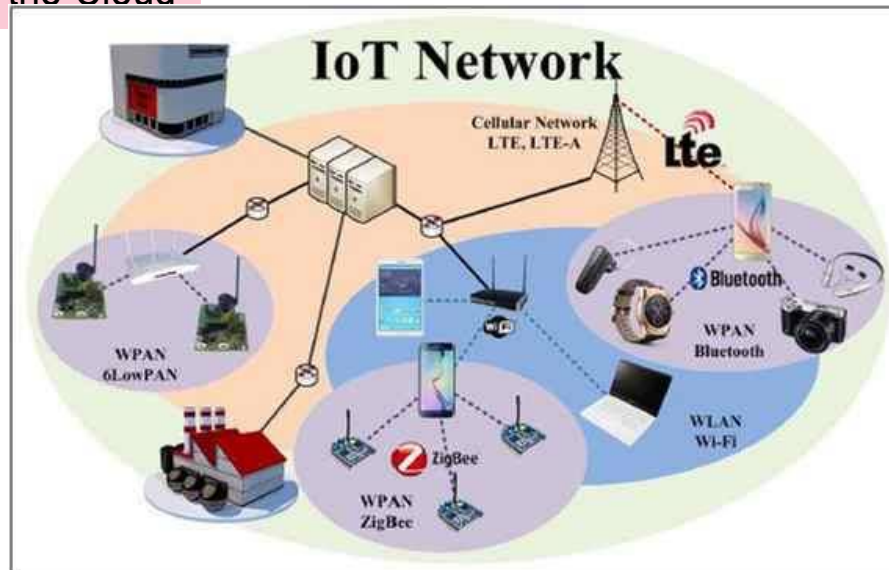
Chips for payment



IoT general elements



- Sensors network
- Data capture
- Data Network
- Router in fx a house
- Data banks in the Cloud

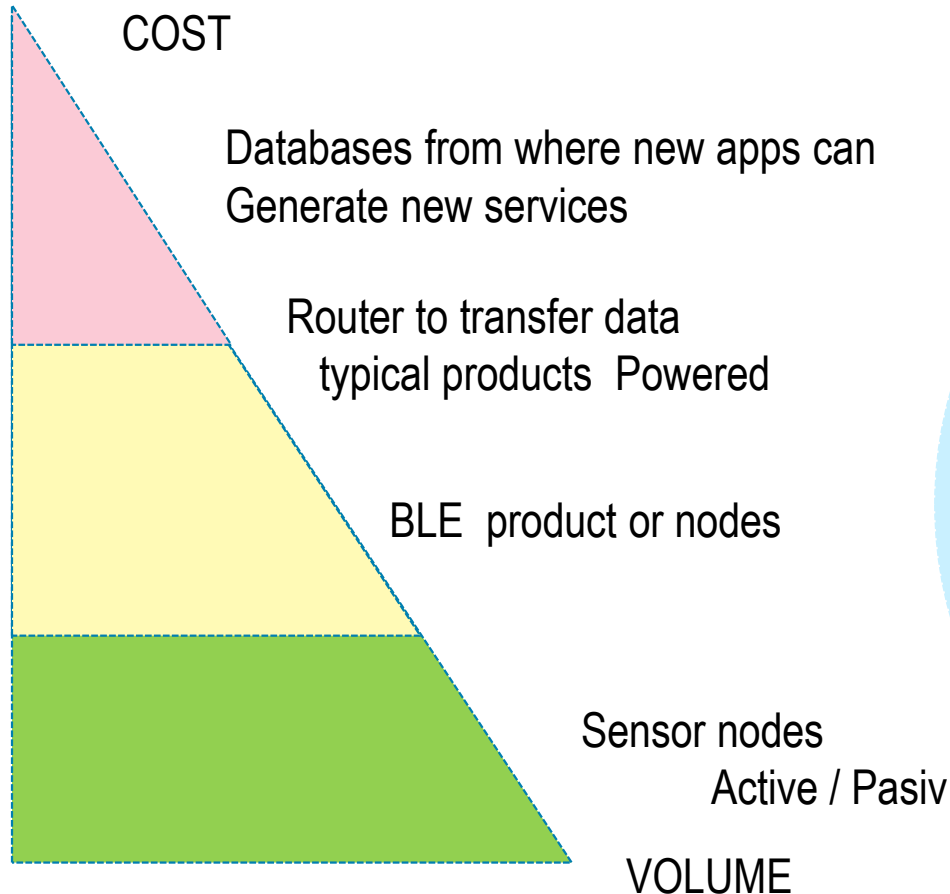


Add intellegense and create new business cases



Delta Microelectronic

Chip company in transistion to IOT



DELTA ME Focus area :

Component supply to

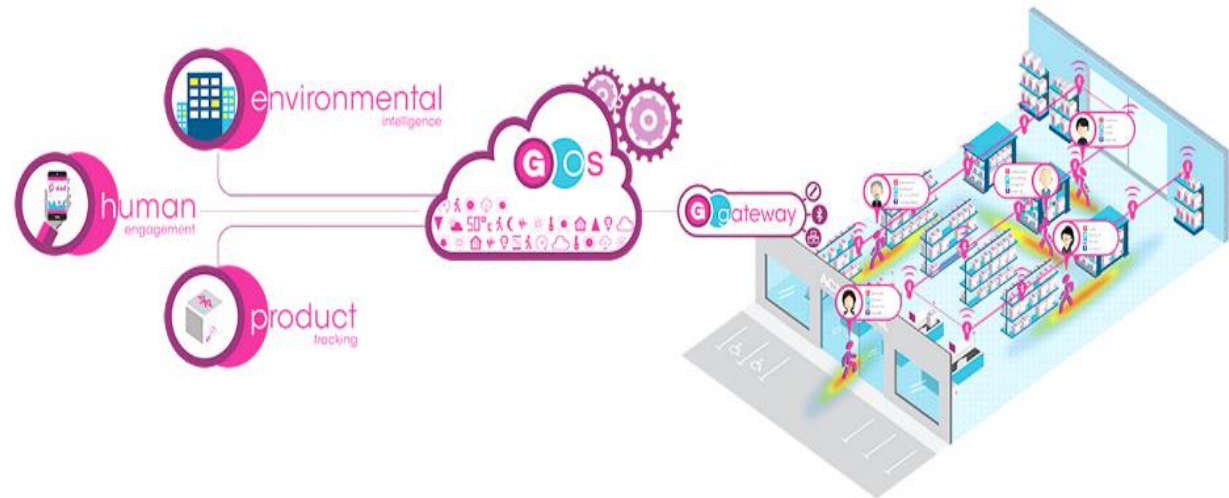
Sensor or equipment data capture nodes :

Optical
Temperature
Humidity
Movement
Accellerometer
Color / luminance / lux detection
Payment

Add intellegence and create new business



Gooee: A new business case evolves





GOOEE – actually thought different...

.....from selling “luminaires” to selling an
“ecosystem”....to selling “data”

We help ideas meet the real world / IDEMOLAB.MADEBYDELTA.COM



The sensor part: Make luminaires smart...

Operating Temperatures

T	a	°C	+/-
---	---	----	-----

Quality

R	G	B	+/-
---	---	---	-----

Colour Temperature

C	C	T	+/-
---	---	---	-----

Light Output

L	U	X	+/-
---	---	---	-----



Motion

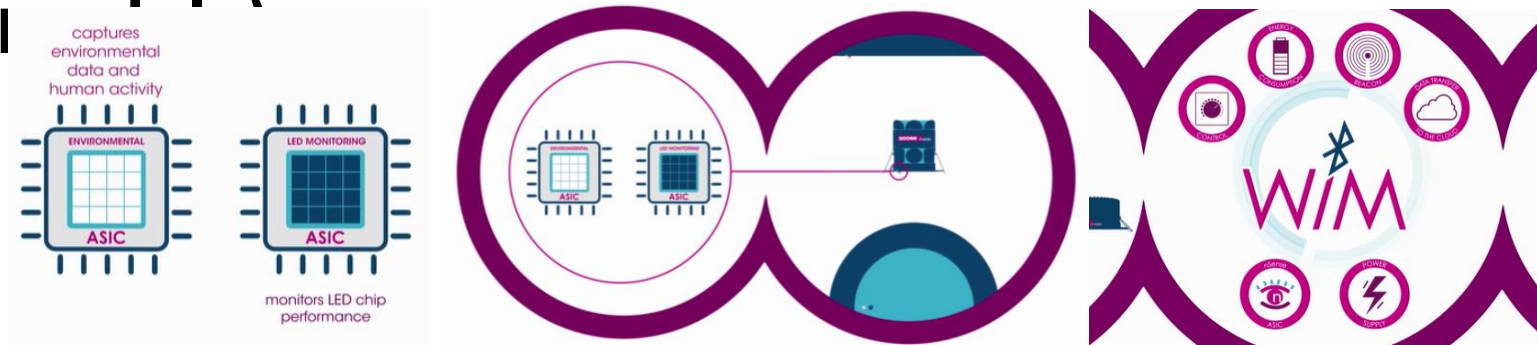
Direction

Footfall

Ambient Light Levels



The communication part: WIM (wireless interface)



- Control of the luminaires and communication equipment
- Multi dimming protocol device
- Communicates with the LED powersupply
- Communicates with the ASIC to provide control over the luminaire
- Monitors power consumption, provide beacon functionality for consumer engagement
- Send data back to the cloud by the GATEWAY



RFID controller for Proff of concepts

We call it THOR

Front-end comply with ISO 14443A-4 and ISO 15693

Available as Tested Dies (KGD) or in QFN

Ultra low power tag storage mode ($< 0.1 \mu A$)

Can be operated with and without battery power

openMSP430 CPU

Ultra low power clock - optional external crystal

12 K samples storage capacity

Firmware upgradable

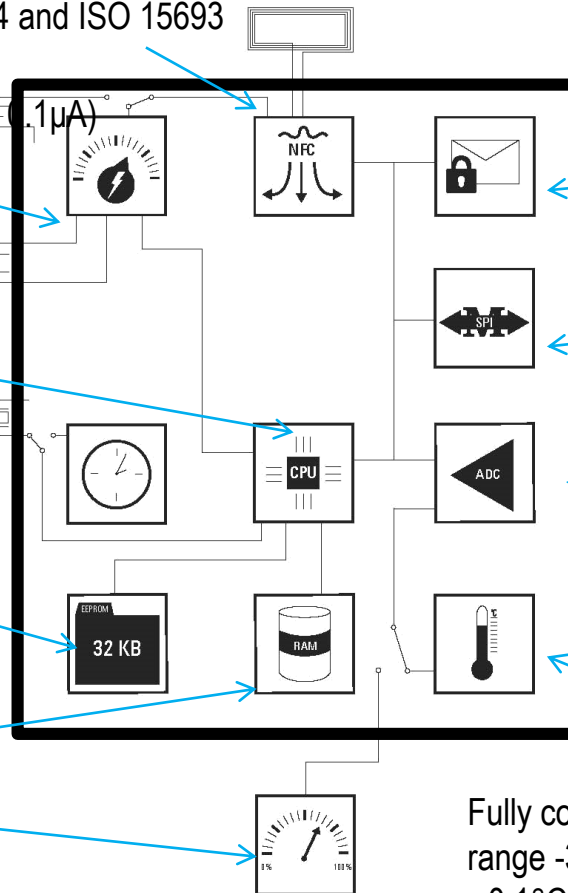
External sensor can be attached

DES encryption hardware support

SPI master interface for auxiliary slave

16 bits linear low-offset Sigma-Delta

Fully configurable temperature logging profile in the range $-30^{\circ}C$ to $+100^{\circ}C$ with accuracy: $\pm 0.5^{\circ}C$ (abs), $\pm 0.1^{\circ}C$ (relative)



DELTA's RFID wireless bridge solution

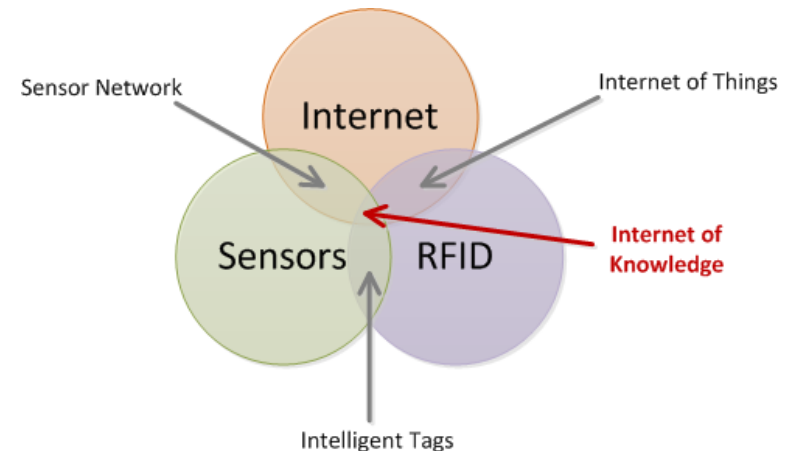
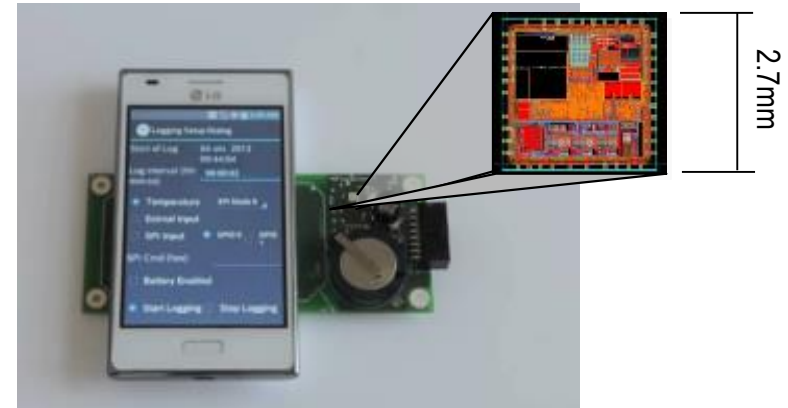
RFID sensor platform "THOR"



- * RFID no-power wireless bridge
- * Built-in temperature sensor
- * A/D external sensor interface (16 bit)
- * NFC compliant RFID interface
- * Multiprotocol ISO 14443 / ISO 15693
- * On-chip data logging
- * Low power – long battery lifetime ($<0.1\mu\text{A}$)
- * Low cost development platform



Demo kit available for fast prototyping



Scan the QR code to watch video on THOR demo kit or note this URL: <http://bit.ly/1BTXsnL>

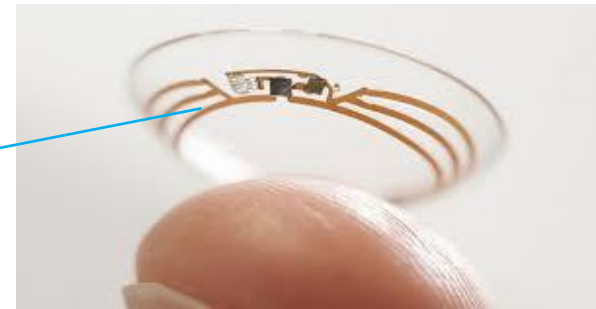
IOT - Wearables

Glucose measurement – Make your Eye linse intellegent

Monitoring glucose levels in tears

Challenge

- * Continuous instead of scattered measurement
- * Not distracting the patient
- * No batteries/wires in the eyes
- * Fast reading
- * ...



Source: Google

Solution

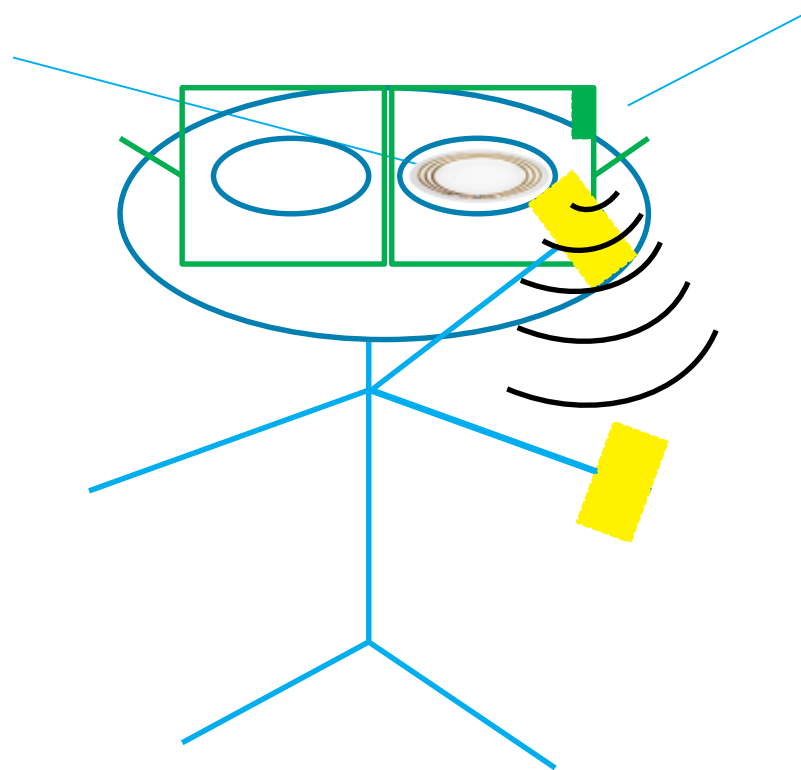
MEMS/Nano sensors and a RFID link to a mobile phone unit implemented in a device positioned in the eye!

Blood sugar measurement – The solution

DELTA / Medella Health version



"THOR" integrated
with novel blood
sugar sensor +
NFC coil for energy
harvesting and
data transmission



Optional: Spectacles
that continuously read
eye sensor via RFID
and communicate with
mobile phone over
Bluetooth Low Energy
(BLE)

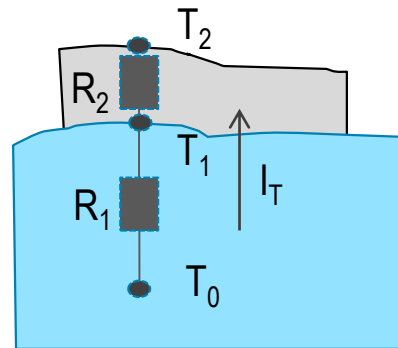
Other IOT application – Temperature

Make you Patch intelligent



More focus on

- * Monitoring continuously
- * Not disturbing the patient
- * Identifying trends
- * Getting alerts



Applications

- * Infant temperature measurement
- * Patient monitoring
- * Wound inflammation monitoring (inflammation is critical for diabetes patients)



A somewhat different RFID temperature application



Measure signs of oestrus or “heat” in order to detect readiness to get bred. Detect pregnancy when heat cycle is missing. This works for mammals and women alike.



Can either replace hormone treatment or to “optimise” the process of getting pregnant.

IOT Case 3 Cigarbox with Temp / humidity logger I

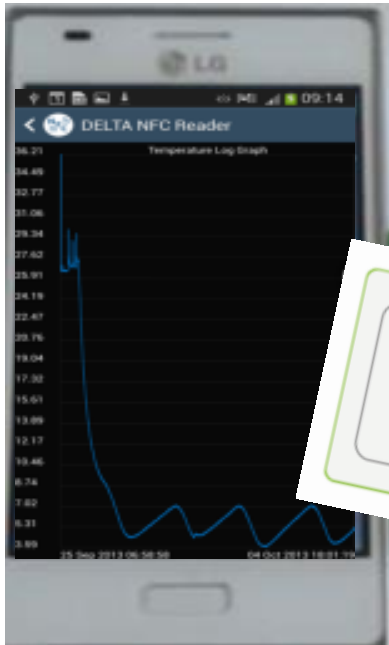
Make your Cigar Box intellegent



- A Cubaen cigar company want to improve Tracibility
- To improve Taste Cigars is stored in temperature and Humidity controlled inviroment Over many years (like Single Malt Schottisch Whisky)
- Storage time can be up to 10-20 years
- To improve trasibility and to make this data available to their end customer
- They added Electronics to make the wooden box intelegent
- Customers schould be able to read stored data form Mobile Phone in the shops



IOT Case 3 Cigarbox with Temp / humidity logger II



Cigar Company got higher trust in promised storage data
open data to Customer in the shops reading from Customer Mobile phone with
Their own created Apps

Consequence : Higher Price for the box of cigar by adding intelligence

IOT and ear-plugs I

**Make the product intellegent and
Create New possibilities**

**Add Microphone and logging
Possibilities**



- Idear :
- Measure Noice from the Industrial invironment from where persons are protected in order to give alert to imployers that limits has been reached
- Measure if you are using it or just in your pocket for company insurance reasons
- Use a docking- board for time registration of workers and Cleaning when workers are not using it and to download data

IOT and ear-plugs II



Company gets

- A noise measurement system for industrial environment (high value product)
- Today noise are a part of a hearing aid equipment , potential is much higher in
- Data registration from different industrial environment to sell for insurance / industry
- Users get more control over noisy environment (airports, train stations ..ect.)
maybe even classrooms in schools)

By adding intelligence to a simple Ear Plug protection unit it seems that a whole new business concept can be created



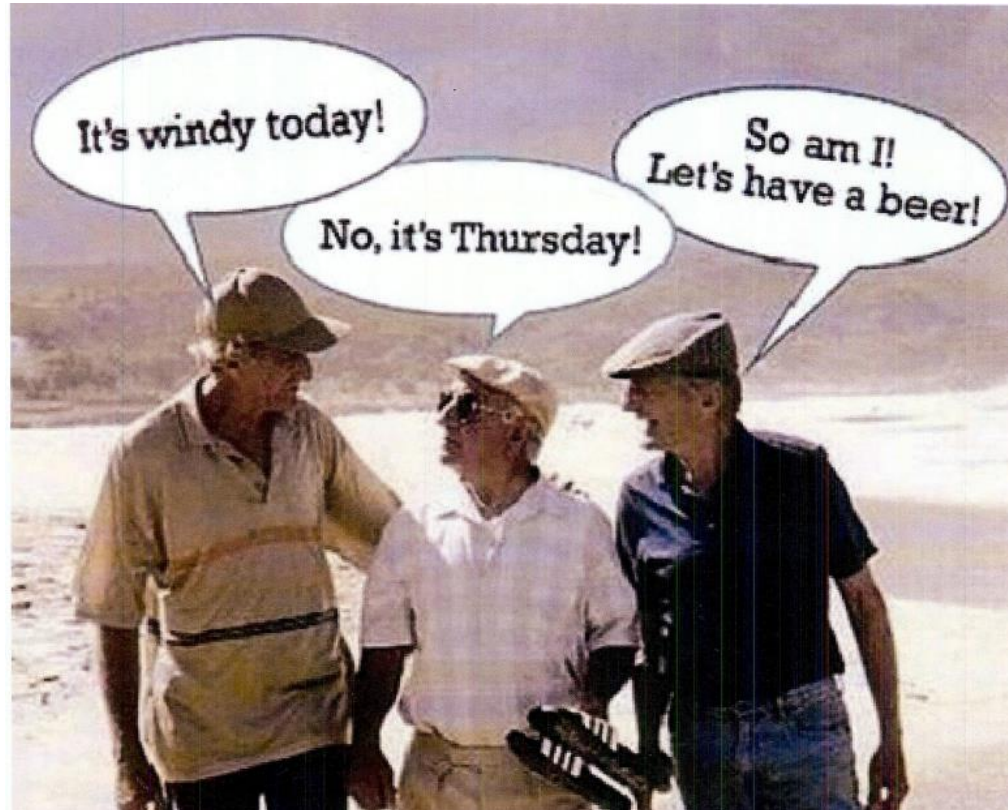
It's still a jungle out there...

360+ IoT platforms
100+ protocols

A background image of a computer keyboard with a semi-transparent blue rectangular box in the center containing white text.



No propper communication – no value





Conclusions

- Add Intellegence to capture Data
- IOT can be intellegent product or Create data with the product
- IOT is not expensive ... Think smart
- To Sell Data can be bigger business than production of product

- Think on the Telephone .. It was a product then it became a service
- Many new-commers in IOT are not from typical Electronic world

- Les get started ... please consult us for discussions



Questions ??

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Or

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