


Interactive Product Solutions

Innovative Ways of Making Packaging More
Effective and Attractive using Printable
Electronics

By:
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The South Fens Business Centre, Chatteris
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The Vision – ahead of its time?



©Minority Report (Philip K. Dick 1956, 20th Century Fox 2002)

“Start with the customer experience & work backwards to the technology”

Steve Jobs

1955 - 2011



“The consumers of the future will expect & demand choice, but that choice will be more between different emotional worlds than between different product features”

Robert Jones

The Big Idea



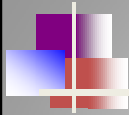
Eye catching magic or
'Minority Report Horror'



**Packaging
that INDICATES Something**

**INFORMATION - BASED
Packaging**



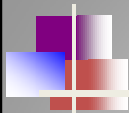


Presentation Overview

1. Emerging Market Needs for Interactive Packaging
2. Printable Electronics
 - The promise
 - Current state-of-the-art
 - What's real now
3. Potential Opportunities



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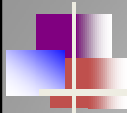


Interactive Product Solutions Ltd

- Development, supply and integration of innovative products and processes, including promotional items & packaging that:
 - interact with people
 - inspire & engage consumers
 - create a marketing platform to support Brand positioning
 - provide new functionalities
- An experienced team for design, engineering, product development & prototyping
- Solutions can be based on any combination of technologies, including:
 - conventional silicon-based electronics
 - new generation printable electronics
- Sister company of IPI (Europe) Ltd - with a long track record of supporting major brands seeking to exploit disruptive technologies www.ipieurope.com

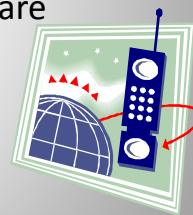
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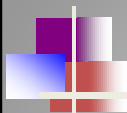
The 'Information Age' is here

- Customer oriented / Relationship based
- Interactive
- Individual (markets of one)
- Serve customers instantly wherever they are
- Rate of change is accelerating
- Technology is a key enabler
- IT'S A LIFESTYLE CHANGE



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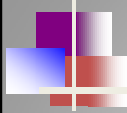
Implications for Packaging

- Make packaging work harder
 - on-shelf differentiation at point of sale
 - stimulate, entice and influence consumer to buy with just seconds for the purchase decision
 - give & get (relevant) data to the consumer
 - communicate the 'brand promise'
- Requires new ways of interacting
 - manual or automatic data collection
 - instant interpretation/automatic
 - full connectivity with the environment pack used
- Green & sustainable
 - recyclable or reusable

Low cost – or no cost – functionality

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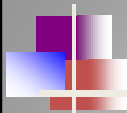
Smart Packaging- Functionality

- Confirm identify & contents
- Monitor pack contents
 - tampering
 - authenticity
- Correct storage
 - temperature & humidity
- Control atmosphere
 - preserve shelf life using oxygen scavengers
- Store data
 - product origin, customer identity, date item was sold & its price
 - operating instructions, regulatory info to ensure products are used correctly
 - traceability

....smart packaging often means different things to different people

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Printable Electronics – Promise

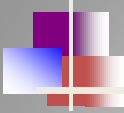
Electronic Products From The Printing Machine

- Lightweight, flexible electronic devices on low cost substrates such as paper or flexible film
 - fully additive, single substrate
 - can be very thin and flexible & can be folded or draped over curved surfaces
 - open up new degrees of freedom in terms of product design
 - costs potentially low enough for single use & disposable

& Environmentally Friendly

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Printable Electronics - Reality

- All major electronics components
 - presently all as separate items
 - Circuits – the 'wiring'
 - Switches, Resistors & Capacitors
 - Displays
 - Batteries,
 - Logic
 - Transistors – but not ICs (integrated Circuits) still at 1970s technology level!
 - Memory – limited
- Products & Devices
 - OLED displays in Cell phones
 - E-Ink displays – Amazon Kindle
 - Solar Cells



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Printed Memory



Source: PRiMeBits

Printed Sensors



All-printed sensor with ACREO display

- Control with/without touch
- Minimized number of materials
- Large Areas Electronics
- Very robust

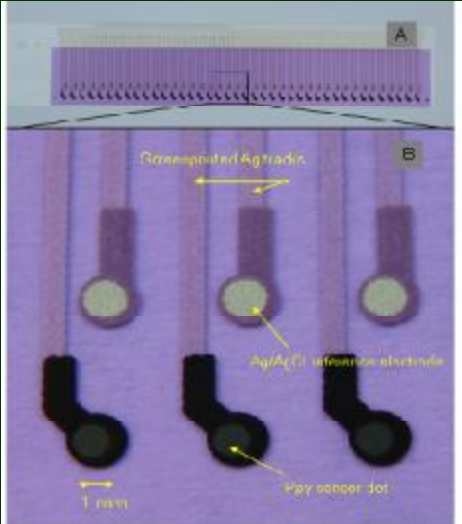
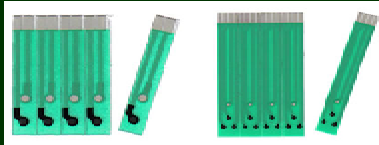
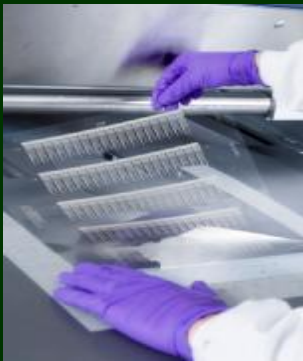
Source: 3Plast Consortium

Printed Transistors



Source: © Nano ePrint Ltd

Biosensors



Source: Universal Sensors

Real Time Condition Monitoring with Visual Displays

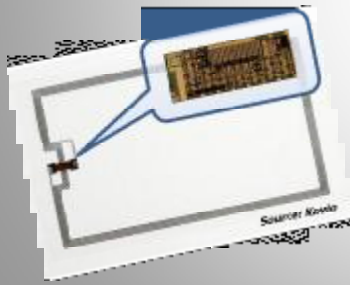


Max Temperature Exceeded

Source: NTERA

Smart Packaging

Printed RFID (ρ RFID) & TTIs



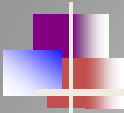
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It's a Mobile World!

- Consumers access additional information about products through their mobile phone/PDA
- Digital Content Purchase & Delivery
- Mobile Coupons
- Authentication
 - Trials underway in Holland & China using RFID & internet servers to authenticate products
- Re-ordering (Mobile EDI)
- Mobile Self-scanning
- PDAs as:
 - readers
 - a power source to activate packs

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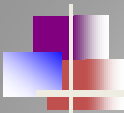
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Drug Delivery



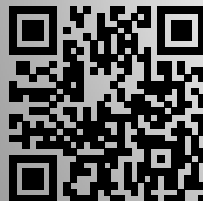
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Interacting with & Influencing Customers

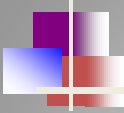


Source: Proxama



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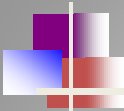
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Location-based Marketing



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Location-based Marketing

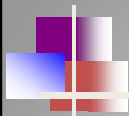


Electronic 'barcode' variation

- Smartphone 'App'iPhone & Android
 - Covert electronic identification,
 - Low cost, recyclable, flexible, robust and hard to counterfeit
 - Easy to print into any kind of product as part of the printing
 - Verifying product & accessing consumer information
 - Just by the touch of the smartphone
 - Back office tracking systems

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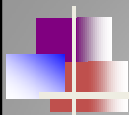
Summary

- An amazing array of technologies with wide choice of commercially available
- Costs vary from £.01 to £100s depending on the type of system deployed & its physical size
- A 'natural' fit with packaging & promotional applications
- Technology push, 'early adopter' market
- 2-3 year market 'induction' period

No one really knows what the 'killer applications' will be!

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