

The Future in High Resolution

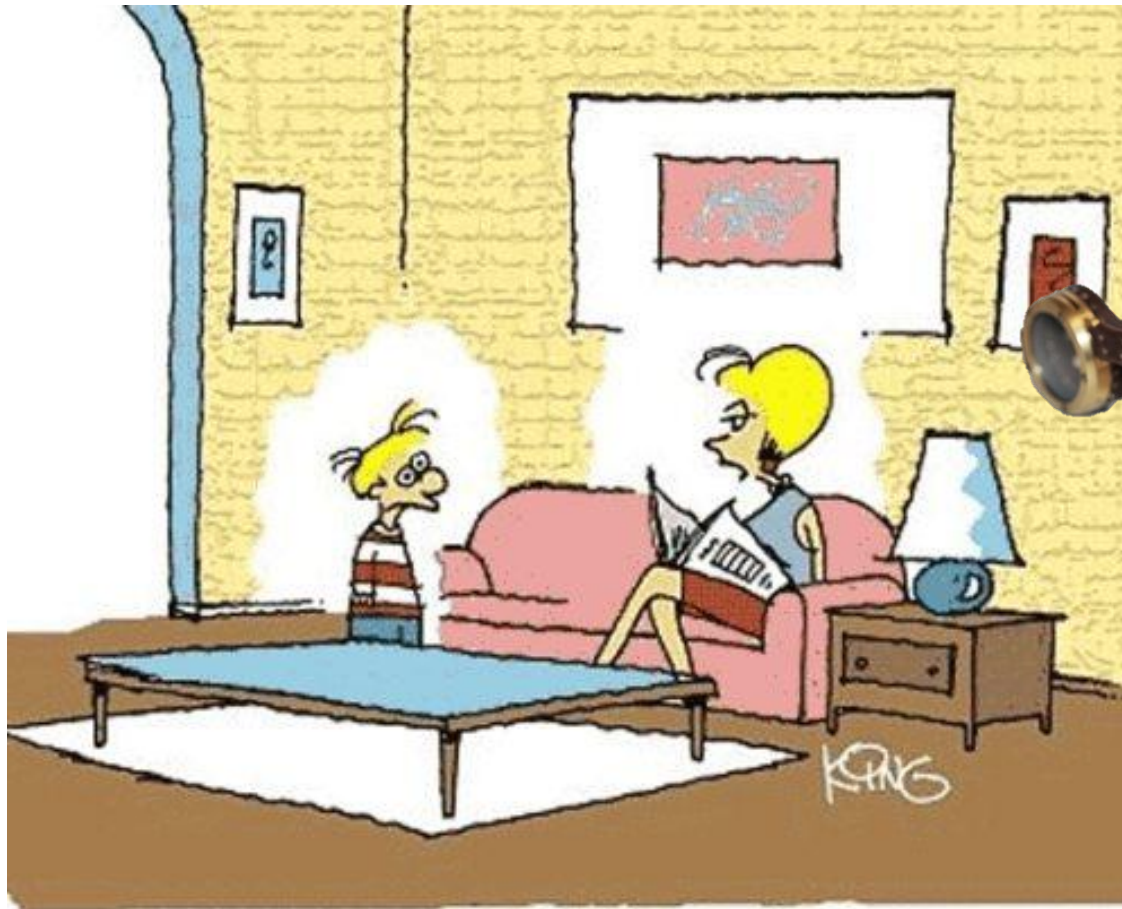
Preben Mejer



Bestfmd og IT Guru



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*"No, you weren't downloaded.
You were born."*

Innovation as simplification

- Innovation is mostly combination, doing things smarter
- Simplification is the lubricant of all things new
- Process innovation is often more lucrative than product innovation



Innovation kræver planlægning

- Innovation som led i strategisk planlægning gør virksomheden 63pct bedre til at innovere end konkurrenterne
- Foregår i dag kun i hver tredje virksomhed
- Mckinsey quarterly





Det er OK at lave fejl !!!



Discovery Driven
Innovation

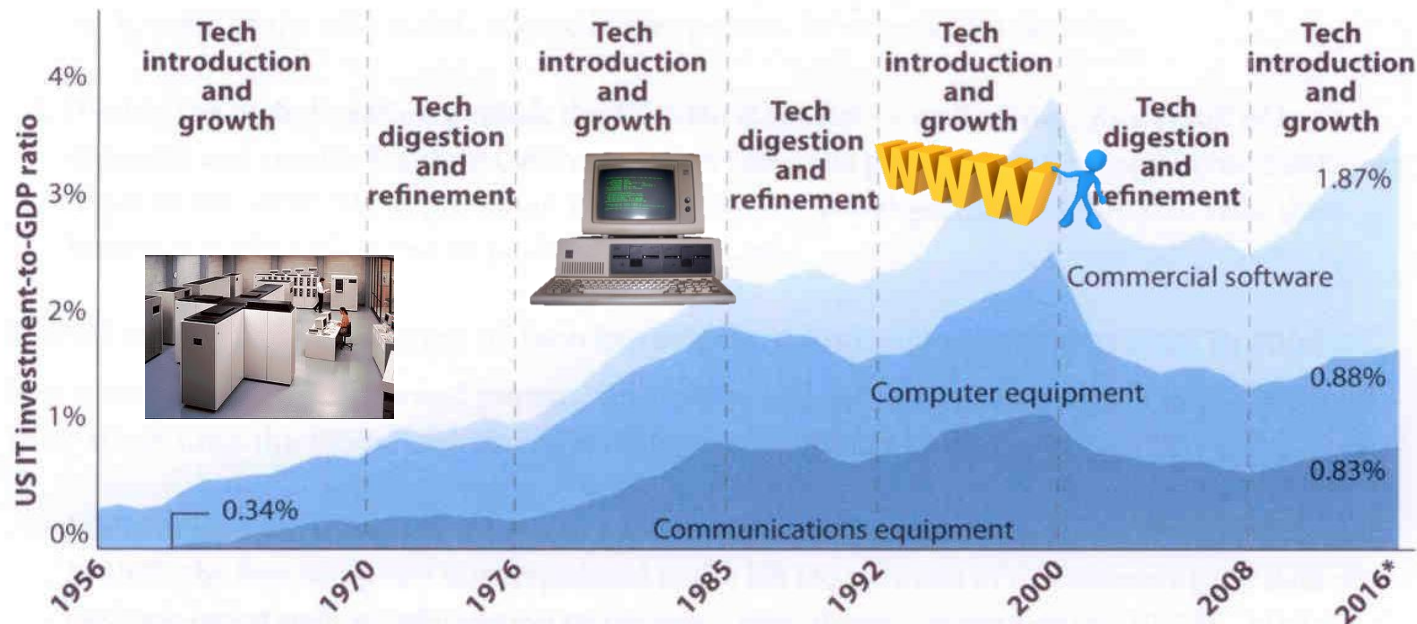
- users, tech, context



Smart Computing

The three cycles of tech growth and digestion

Business and government investment in IT as percentage of GDP



Source: US Commerce Department for 1956 to 2008; Forrester Research forecasts for 2009 to 2016
 *Forrester forecasts

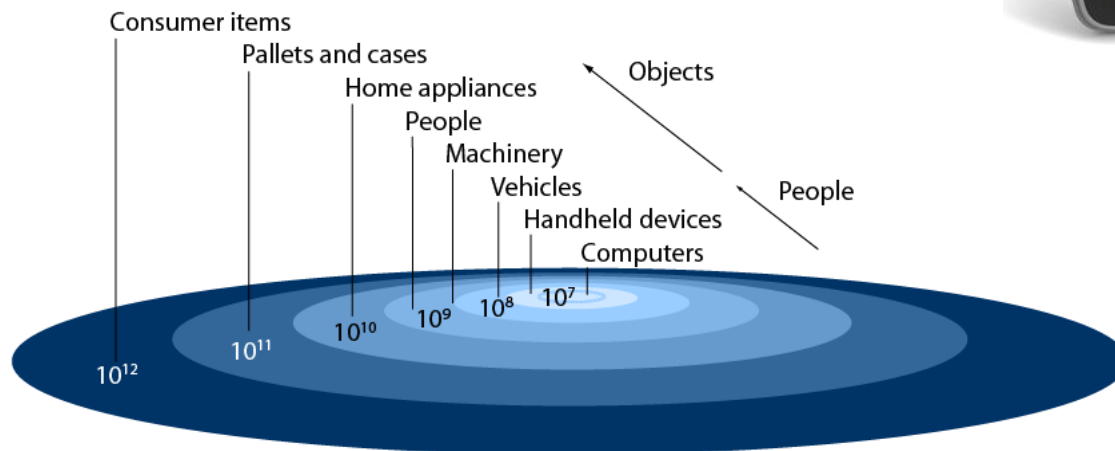
Smart Computing

- Data i alt, fra alt, overalt
 - Sensorer, RFID, NFC ..
- Sammenheng i systemer, data i skyen, nye forretningsmodeller
 - Real Time Reality Mining
- Mobile Future
 - Anywhere computing



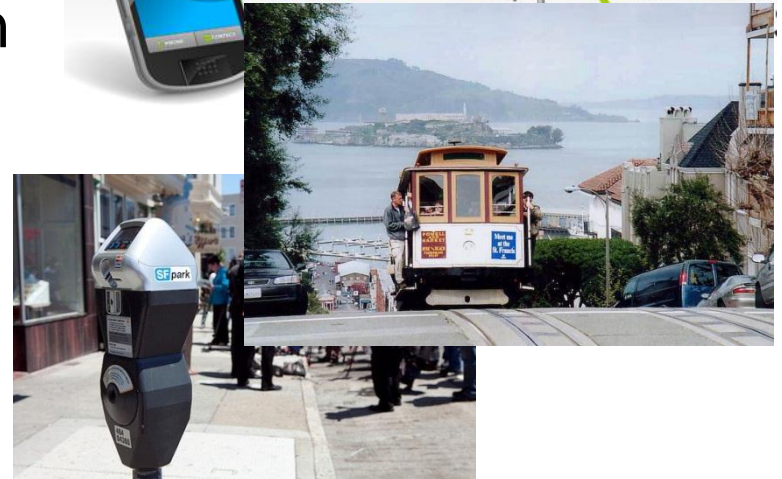
Smart Computing

- Data i alt, fra alt, overallt
 - Sensorer, RFID, NFC ..
- M2M to grow from 60m in 2010 to 2b devices in 2020 – potential 20b
Analysys Mason
- RFID 2.1b sold – 2010 ! IDTech



Smart Computing

- Sammenheng i systemer, data i skyen, nye forretningsmodeller
 - Real Time Reality Mining
- San Francisco will become the first major city to use sensors in the road to alter meter prices
- Nudging people to park in less congested areas
- Smartphone apps will display vacant spaces

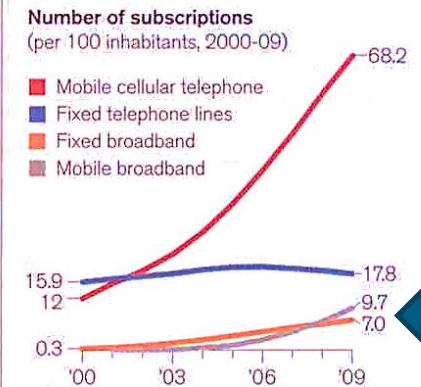


Smart Computing

- Mobile Future
 - Anywhere computing
- Smartphone giver PC baghjul
 - Q4 2010 global sales 101m smartphones, 92m PC's – IDC
- Web penetration was about households
- Mobile usage is about individuals, both adults and kids
- Tech review



MOBILE MIGRATION
Wireless technologies are outpacing their wired equivalents.

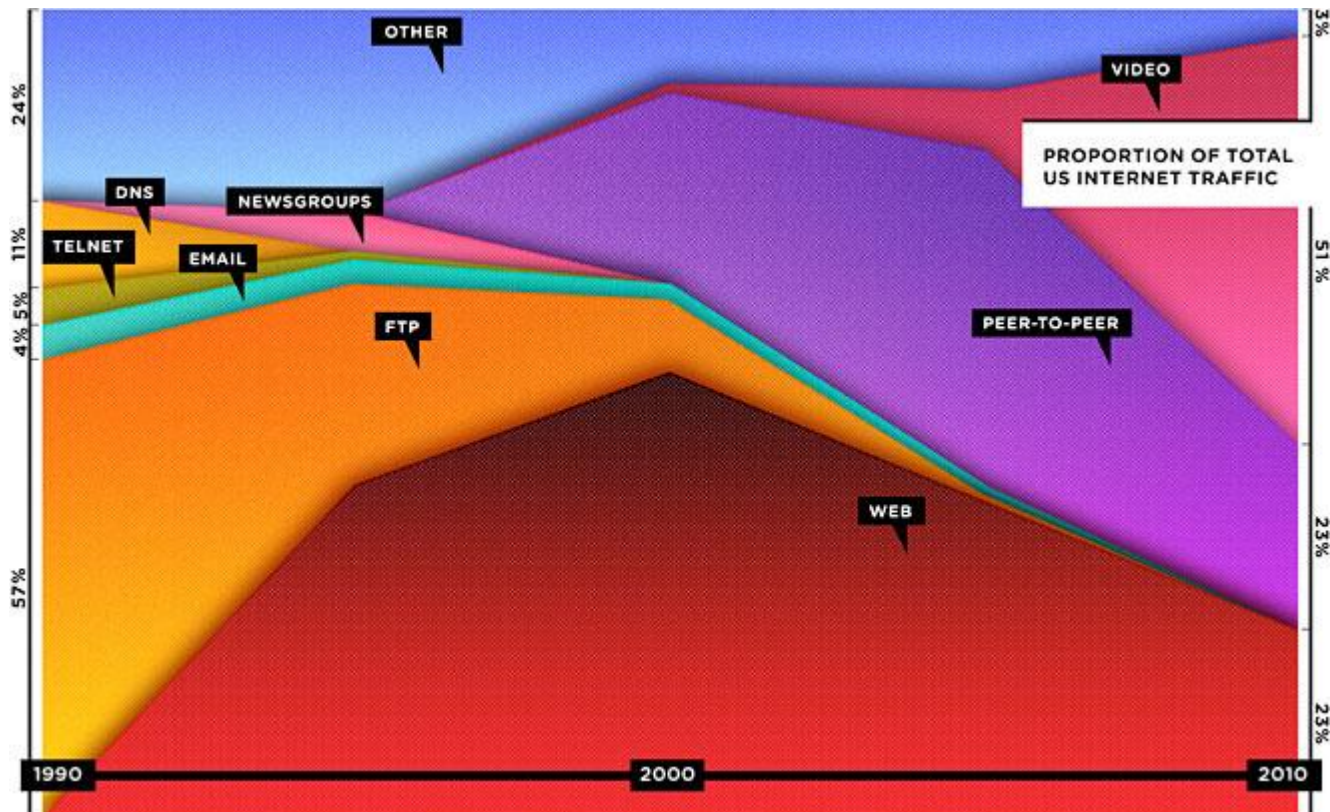


Sources: ITU World Telecommunication/ICT Indicators database



The Web is Dead Long live the Internet

➤ Information - i skyen, men ikke længere nødvendigvis web



From Internet to Splinternet

App stores for your fridge or your Car



- App stores will start to support apps for embedded devices, set top boxes, refrigerators
- Saab NG93 to be launched 2012 comes with Android app store.
- 50 hp more on request
- 500 measure points on car open for app developers



The Web is Dead Long live the Internet



The Web reborn – HTML5

- HTML5 has a central goal to give websites the chance to expand beyond pages and into programs
 - HTML5 also has tags for video and audio, making it easy to incorporate any kind of multimedia
 - Also will include a feature that allows browser to store up to 5 megabyte, enabling it to run off line, and sync with web site
- Tech review



```
<!DOCTYPE HTML PUBLIC "-//W3C//DTD HTML 4.01//EN" "http://www.w3.org/TR/html4/strict.dtd">
<html>
<head>
  <meta name="TITLE" content="HTML5" />
  <meta name="KEYWORDS" content="HTML5, HTML5 tags, HTML5 features" />
  <meta name="DESCRIPTION" content="HTML5 is the next major revision of the World Wide Web markup language HTML." />
  <link rel="stylesheet" type="text/css" href="css/html5.css" />
  <script language="javascript" type="text/javascript" src="js/html5.js" />
</head>
<body bgcolor="#ffffff" />
```

Communication Decline of mail, e-mail – and phone calls



- Post Danmark, 2009 og 2010 faldt mængden af breve med 10 pct – begge år .. Ritzau
- Drop in e-mail of 6 pct, visits from teenagers to mail sites dropped 18 pct – Comscore Q4 2010
 - “Email is for old people” A student–headline in the chronicle of higher education – mark prensky
- Fewer calls - US avg no of mobile phone calls peaked in 2007, and drop every year
 - Shorter, too, in 2005, avg 3 minutes, today half –
Wired



Communication as a continuous flow

- Digital natives do not make phone calls
 - They are in constant lightweight contact using texting, chatting and social network messaging
- The phone call is interrupting as it does not provide status about if it is OK to call
- Phone calls now tend to be coordinated
 - Some of our phone time will migrate to other media, video - Wired
- Like wearing eyeglasses – the rims are visible, but the wearer forgets he has them on – even though they make the world clearer - IFTF



Power to the People

- Internet, Twitter and Facebook gave power to the people – mobile devices enables them to use it
- Mumbai, "don't tweet where anti-terrorist forces are, terrorists may use twitter"
- In Iran, the people connect with the outside world, bypassing news agencies blocking all sources
- Egypt, advise to demonstrators, Tunesian demonstrators advice egyptians on Facebook, use onion on your scarf against tear-gas
- IHT

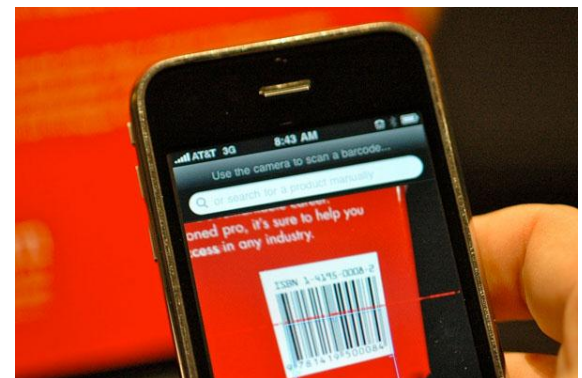


From online to OnSite

- Instant discovery

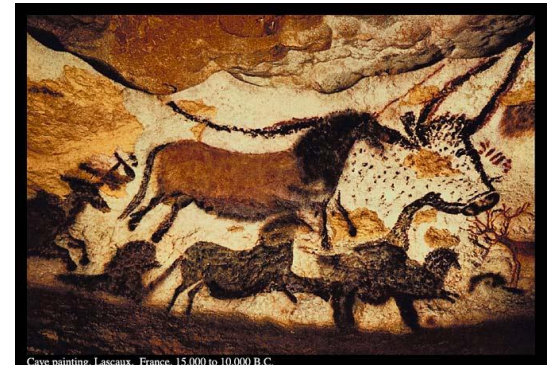


- Fundamental transformations unleashed by mobile devices
- Mobile search has made discovery ubiquitous in the physical world of daily life
- Geo tagging and location aware services have made discovery a two way street, Locately track car routes and foot paths on shopping trips
- Read laser and shopsavvy scan bar code enable instant price comparison
- This will force changes in the way all retailers do business



Outsourcing (our) memory

- Fundamental transformation unleashed by mobile devices
- The ability to record memory has played a crucial role in human existence
- From cave paintings to mobiles, we are outsourcing memory to our devices
- Google Maps bookmark places we have visited, and remember their context, shopping, work, friends house
- The outsourcing of memory also extends to images
- This may be the end of forgetting



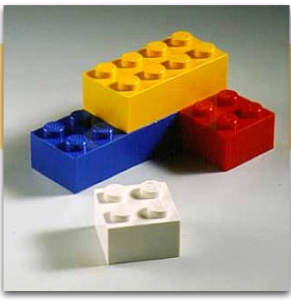
Cave painting, Lascaux, France, 15,000 to 10,000 B.C.



Multiple choice Devices

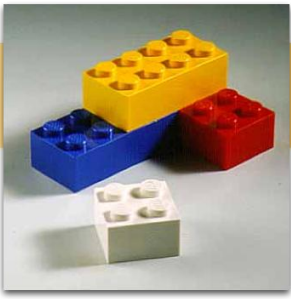
- From one-size-fits-all to.....
- Use-defined design form factors
- Multiple choices
- Personal - Lean forward, lean back
- Shared devices – TV, public
- 4th screen – large format public displays
 - 1-2-3 mobile-pc/tablet-TV





Printed OLED display

- Ink printing make cheap OLED displays
 - DuPont, printing a 50inch display in 2 minutes
 - New ink is insoluble of adjacent layer
- Also last 15 years, a major concern of OLED is lifetime
- Evolve into lighting, decorative uses



Bigger touchscreens

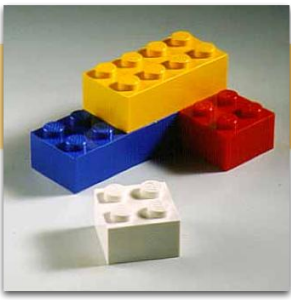


- Next years touchscreens will go right to the edge
- Change from tin oxide of silver reduces black out area Tech Review

2-person 3D without glasses

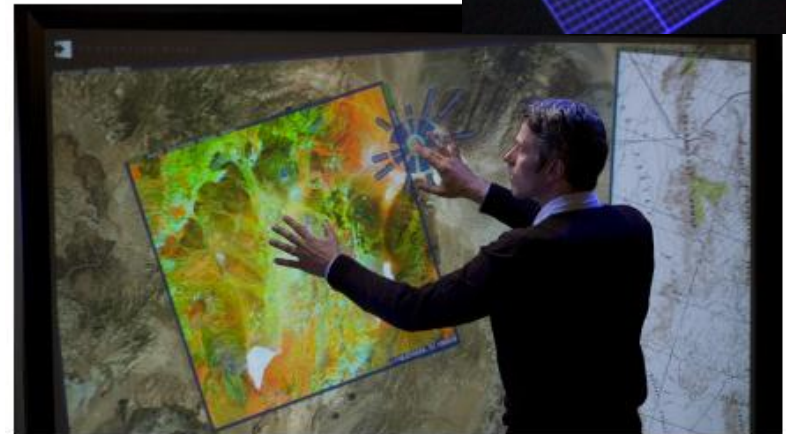
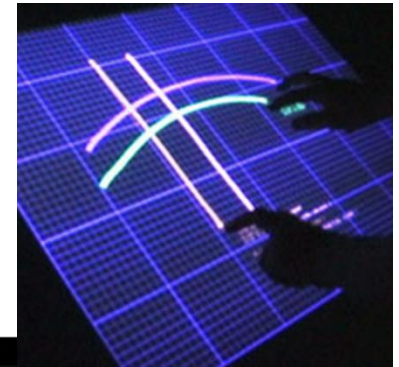
- Lens steers light to viewers eyes by switching LED's along bottom edge on and off
- 3D display uses camera to track viewers so it knows where to steer light
- Light enters lens, bounces around and leaves at critical angle
 - Light shine through LCD projecting images.
A normal 240 hertz LCD makes two 60 hertz 3D views
- Any slower makes video jerky
- Microsoft Research

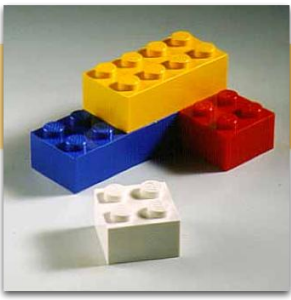




Interaction

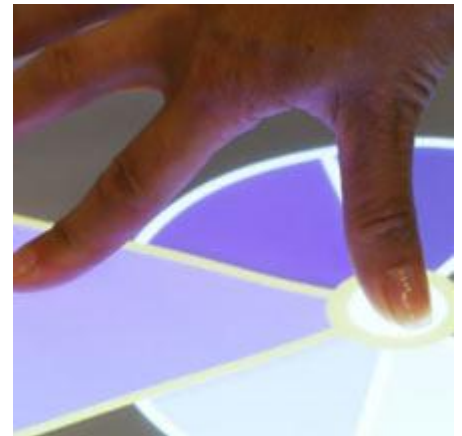
- Tap is the new click
- Two kinds of interactive gestures – touchscreen (iPhone) og free-form (Wii) (Dan Saffer)
- Microsoft Kinect
 - Up to 6 users, 3D infrared sensors
- Perceptive Pixels
 - Touch and pressure sensitive, up to 4 users

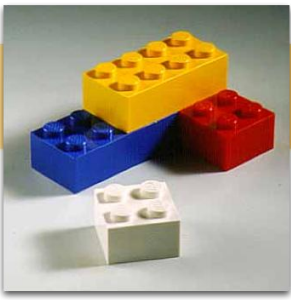




A touch screen with texture

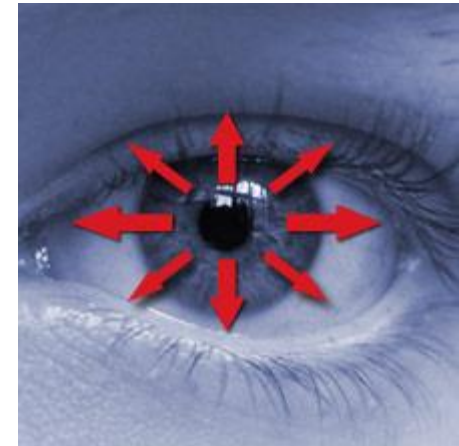
- Touch screens use vibration of device
- Electro-vibration simulate feeling of localized vibration and friction
- Tesla touch, one finger stationary, other experiences sensation of friction as it moves
- Surface can be made to feel bumpy, rough, sticky, vibrating
- Limits now is finger has to move, display can only create one sensation at a time, solutions to both issues are under way
- Disney research, Carnegie Mellon

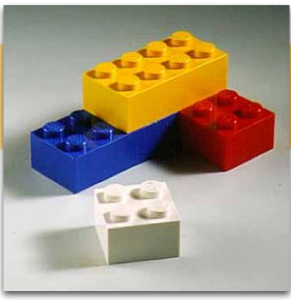




For your eyes only

- System tracks eye movements as icon roam screen, icon moves different every time
 - Slight variations in trajectory, unique to each person
 - Challenge response sequence security
- ID-U Israel





Access only by walking

- Passive biometrics, knowing you by something you do anyway, like walking
 - Walking, gait analysis, hard to imitate and very individual
 - Smartphone use MEMS accelerometers, measuring in 3 axes
- Dartmouth College, New Hampshire

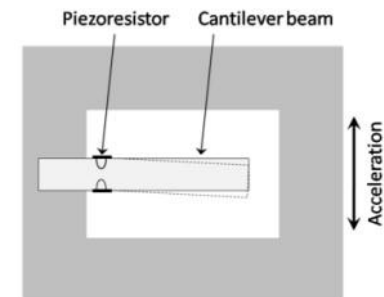
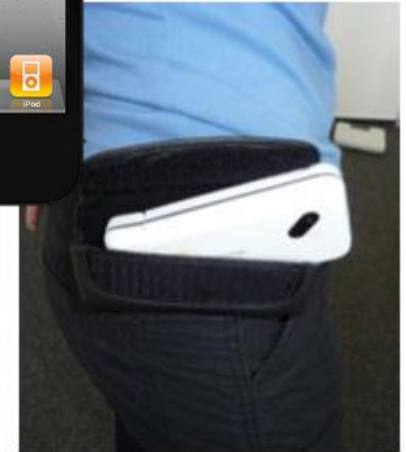


Figure 1. Schematic diagram of a piezoresistive accelerometer.

TV+Internet = SmartTV

- Web merge marks end of flow-TV
- Social TV – multiple devices
- Wireless power – Intel demo
 - 80pct efficiency 1m up to 3000w



Interaktive outdoor/indoor display



➤ TruMedia measurement-system

- tilpasser indholdet i forhold til køn og 5 aldersgrupper.

- East Japan Railway Water company



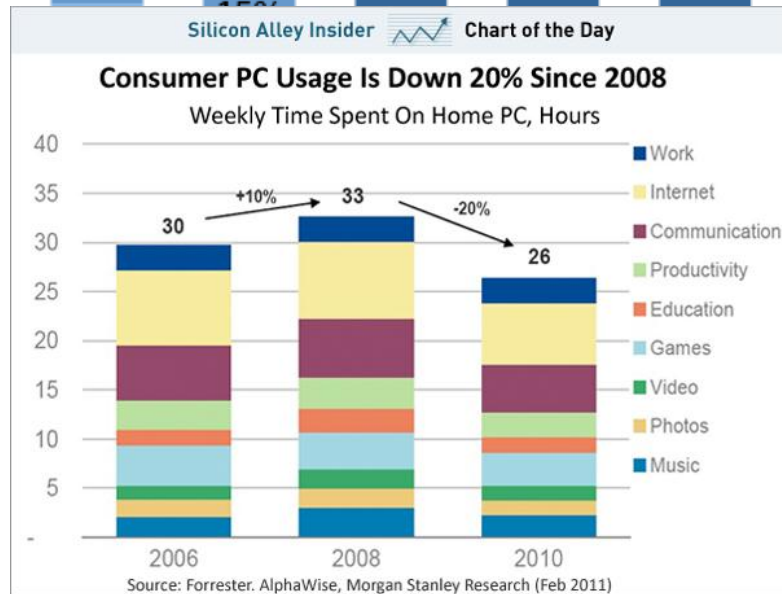
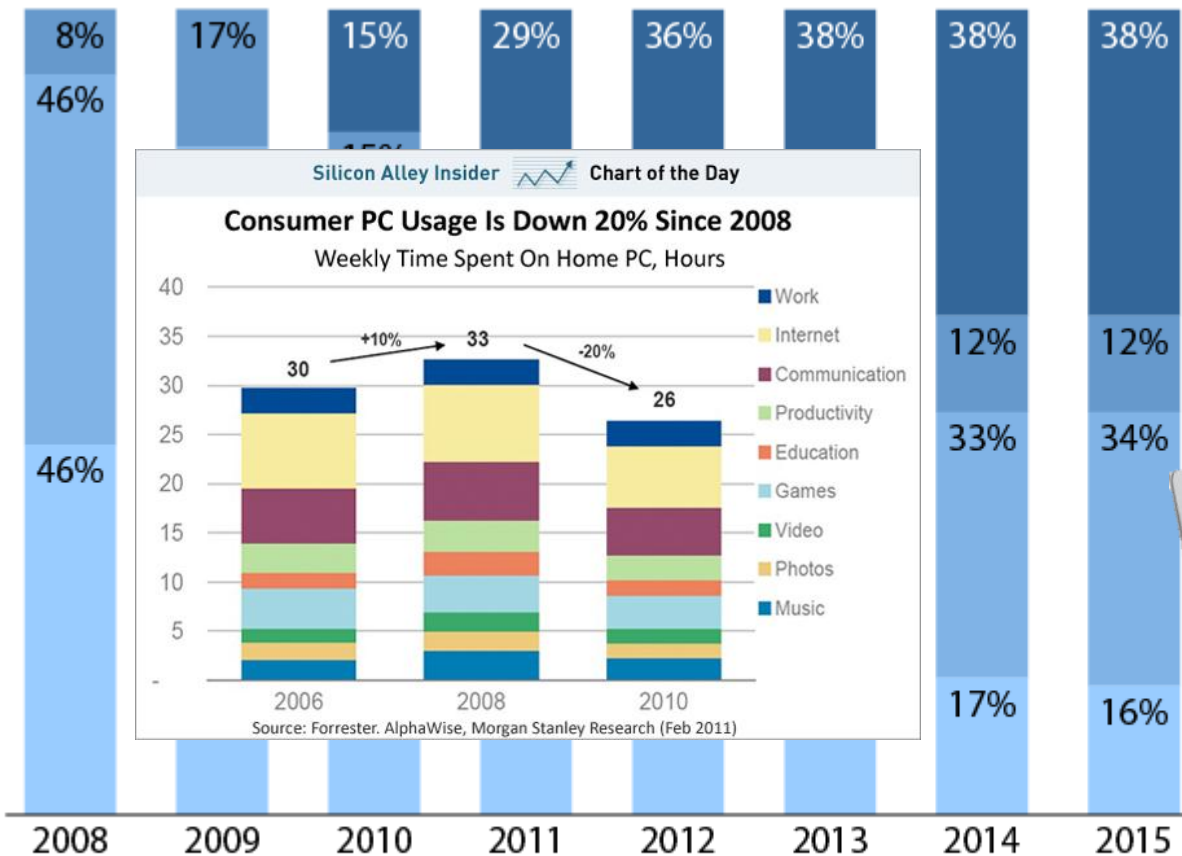
COURTESY JR EAST

PC design themes



Percentage of PC unit sales, US

- Tablet PC sales
- Netbook/mini PC sales
- Notebook/laptop PC sales
- Desktop PC sales



(percentages may not total 100 because of rounding)

Source: Forrester Research eReader Adoption Forecast, 2010 To 2015 (US)

Device future

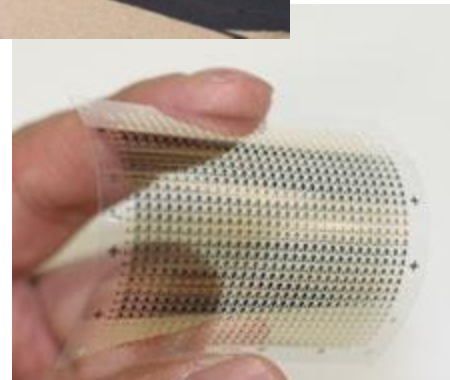


- Desktop PC's small share and mainly all-in-ones like HP smartscreen
- PC Net and notebooks morph and diversify operating systems
- Tablets are lifestyle devices, consumers upgrade when new models are released
 - PC type tablets fcast 40m units 2015
 - Mobile operating systems fcast 203m in 2015
 - 2015 Apple 35 pct, Google 36 pct
- Smartphone
 - Q4 2010 global sales 101m smartphones, 92m PC's
- eReaders
 - 10m eReaders 2010, 60m 2015 US base Forrester, Ovum ISuppli

Mobile design themes



The 20 usd eReader

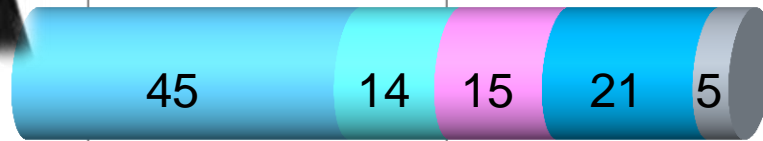


- Why not just make it a screen and a 2-5 usd radio chip?.
- Mary Lou Jepsen, OLPC designer, PixelQi
- Plastic flash memory, university of Tokyo
- Batteries made of nanotube ink on paper, Stanford University



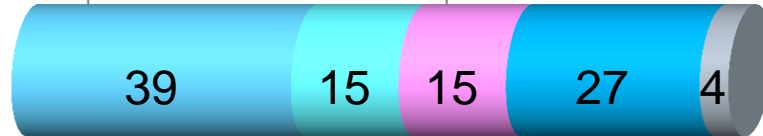


2015



MicroKIA

2011



- Android
- Bbry
- iOS
- Win7/Symbian
- Others

0%

50%



- IDC CAGR 20 pct 2011-2015
- Win7 Symbian combined
- Bbry / Android?
- Apple iPhone broader range

Smart Computing Google Goggles



- Snap a barcode , Goggles shop for best price
- A picture of a book, logo or person will link to wikipedia for subject
- Eiffel Tower will give you historical background

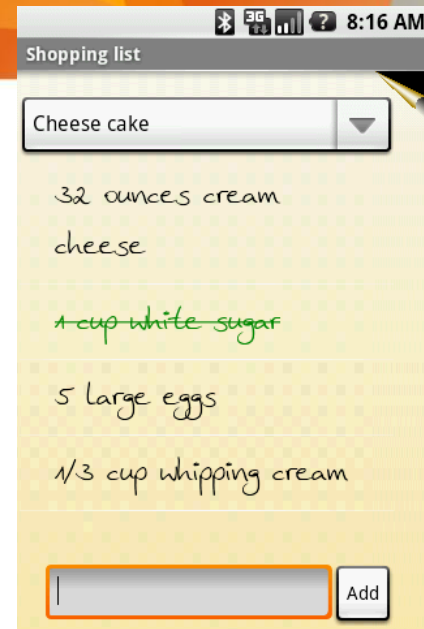
➤ Goggle in the Cloud

- Googles Superroot server software, coordinate multiple object specific recognition engines
- One for text, one for logo's, one for photo's of landmarks – next, plants
- Superroot sends to object engines and apply algorithm to decide result to report back to user
- Modular design makes it easy to add new categories



Indkøb med en digital overfrakke

- Foursquare, GoWalla, Stickybits
- Shopkicks signal hardware triggers check-ins
- Geoloqi allows users to set automatic reminders and notifications for specific locations
- Grocery list pops up as user enter supermarket
- Digital indoor maps
- Fastmall and Micello, create phone-accessible guides to malls, airports, convention centers
- Aisle411 help shoppers find retail products



NFC, Share, Discover, Pay, Ticket



Touch to Share



Touch to Discover



Touch to Pay



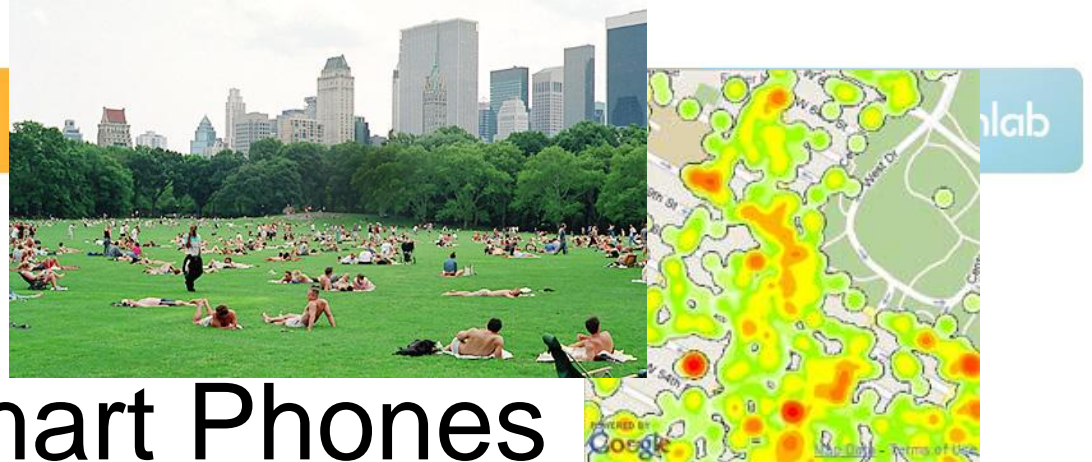
Touch to Ticket

- 2014, NFC based payments acct for 1/3 of 1.13b usd worldwide mobile transactions IEmarket research est

NFC apps

- Taglet - swapping numbers with another NFC phone, or getting a city guide by swiping another phone or a poster
- Enable table, a restaurant coupon service.
 - Restaurant menus or folders handed to diners, receiving virtual coupons to redeem later
- Google Hotpot - advertising scheme beam coupon or reward to customer while shopping
- Google Zetawire, enables diners to split and pay bill using mobile devices





Follow the Smart Phones

- Skyhook Wireless – pool of anonymized data from mobile phones, show user behaviour in major cities of US, resolution 100 meters
- Above, Central Park snapshot
- SpotRank available through API to developers as a cloud based service
- Can be used for traffic advice, dynamic pricing on bill-boards, "social weather forecast" to see where people are gathering – or social compass
- Sense Networks offer service in San Francisco

Mobile Future Fremtiden i Fremtiden



- Ikke bare situationen lige nu, men hvornår letter trafikken



Search the future Predictive search –

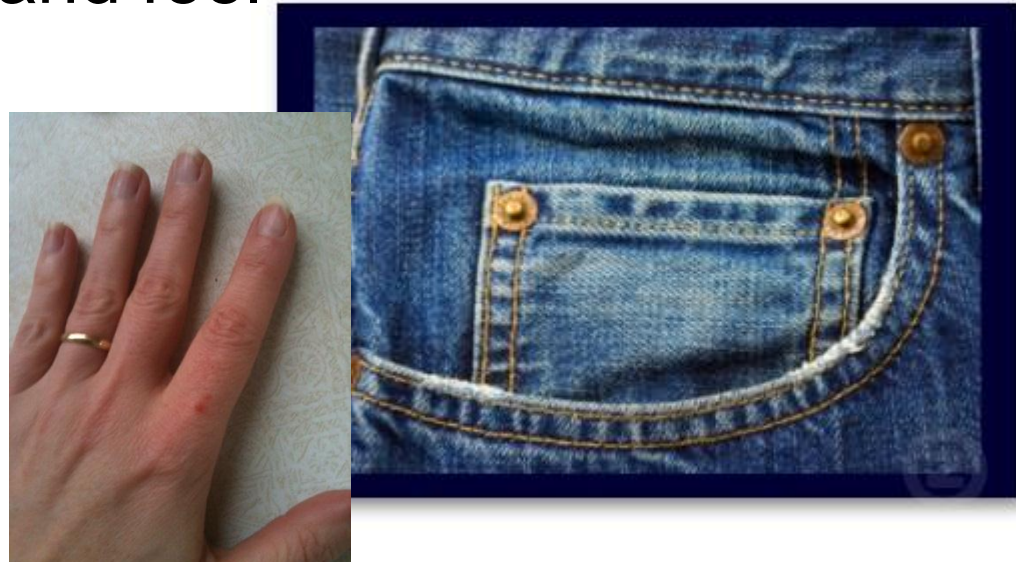


- Instead of Google link ranking, Recorded Future goes deeper
 - Analyzing content of pages, tracking connections between people and events
 - Looking at patterns like Apple expected product releases or plans to invest or expand into India
 - Searching on drug company Merck generates timeline showing recent earnings, but also when drug trials will end
- Recorded future use linguistic algorithms to identify events
- Can track the sentiment of news coverage, also classifying if it is good or bad

Mobile Future - Føle

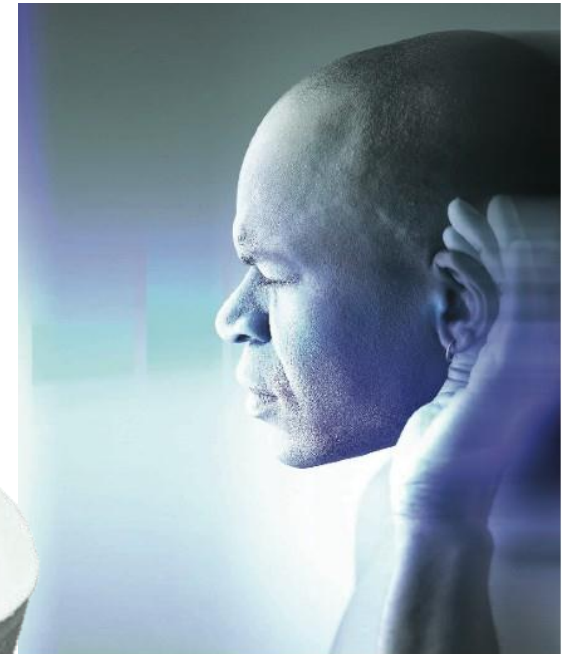


- Real virtuality, det omvendte af virtual reality
- Tactile / fysisk feedback
- Genskab look and feel



Mobile Future – Lytte

- ShopKick
- Tryghed, reagerer på forkerte lyde, indbrud, skud, knust glas
- Kender rummets akustik, ved at jeg ikke vil forstyrres på toilet eller min yndlingscafe, eller i dette møderum



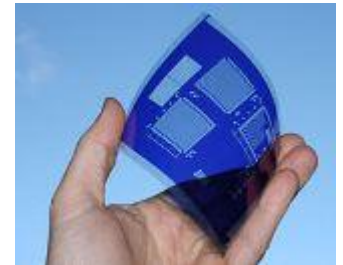
Smart Computing Coming up: Printed RFID tags



- Ink jet printing of carbon nano tubes etc, printing transistors
- Est cost 3 cents, coming down to 1 cent

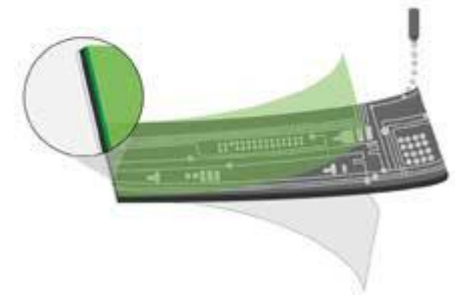
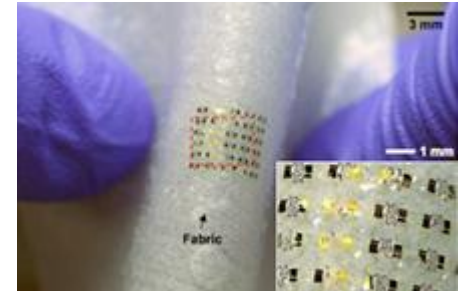
PARC printed electronics

- Printed sensors, transistors and memory devices
- Thin film Electronics co, Norway - memory devices in toys 2011 like playing cards
- Soligie print temperature sensors found in air conditioners, ovens and drug shipment containers
- Tech Review



Stretchable Silicon

- Reebok and MC10 make sportswear that integrates electronics
- Conformable electronics, incorporated inside clothing
- Sensor tape for US military mounted inside helmets to record blast strength, temperature
- Tech Review

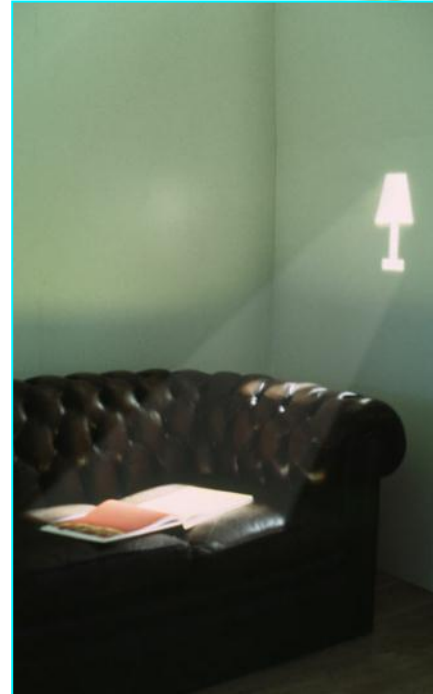


Flexible color displays

- US Army evaluating 4.3" flexible OLED displays as wristband
- Display uses 1/4 of traditional OLED power
- University of Ewing, New Jersey on electronics foil from LG



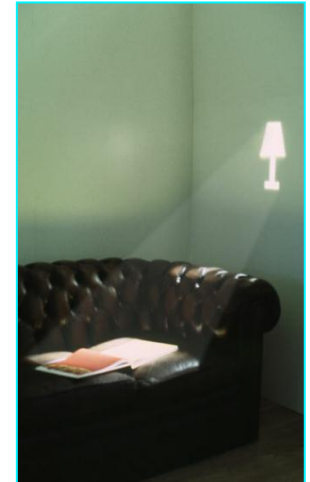
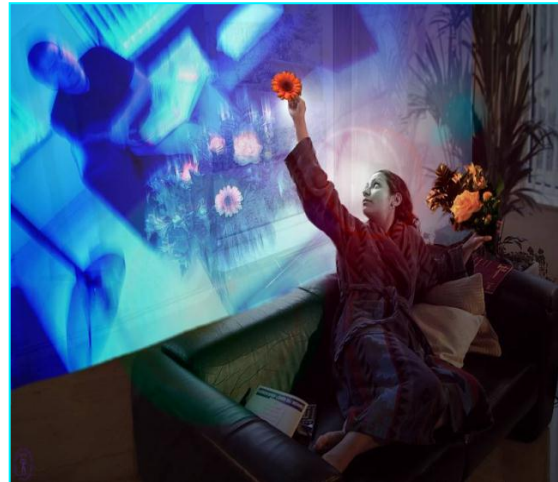
Why isn't my house
out-thinking my dog yet





Kommunikation i hjemmet

- Bluetooth 4.0
- Zwave
- Zigbee
 - Frekvens 2.4GHz, 868 Mhz
 - Rækkevidde 75 meter
 - Båndbredde 250 Kbit/s
- WiFi Direct
 - Frekvens 2.4 Ghz
 - Rækkevidde 200 meter
 - Båndbredde 250 Mbit/s
- HomePlug® Powerline Alliance, now IEEE 1901
 - HomePlug AV2 600 mbps
- Intel Light Peak Fiber Connectivity / fiber or copper for power transmission
 - Replace USB, HDMI and others 10Gbps - 100 Gbps
 - Lenght up to 100 meters



Trådløs kommunikation - eksempler.



ZigBee indstiks-modul til måler



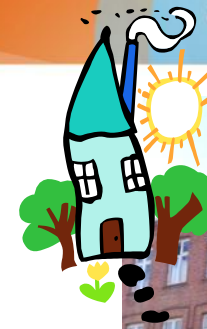
Enkelt kontakt tænd/sluk ZigBee!



Tænd/sluk "gruppe-relæ"! ZigBee







Grøn uden afsavn

- Fra 9500kWh til 4500 kWh
- IT styring
- Belysning
- El-varme

■ IT mm

■ Belysning

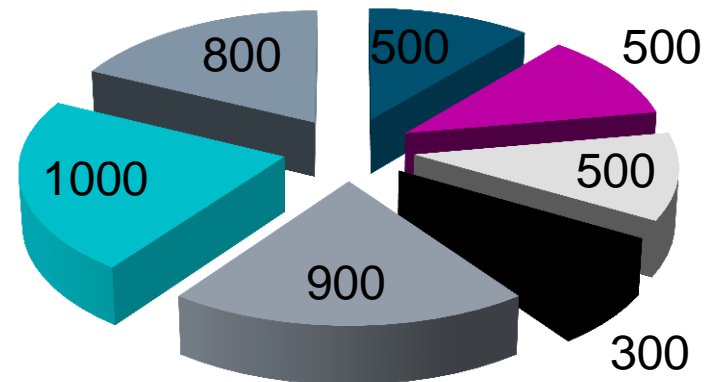
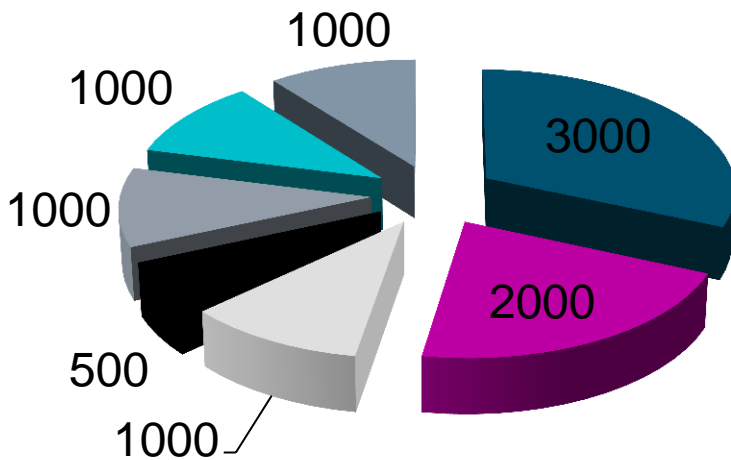
■ Sovevær

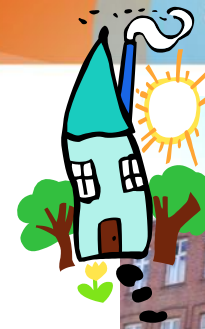
■ Stue TV Akv

■ Kælder vask frys

■ Køkken køl kog opvask

■ Ventilation mm





Det intelligente hjem - fra 1888

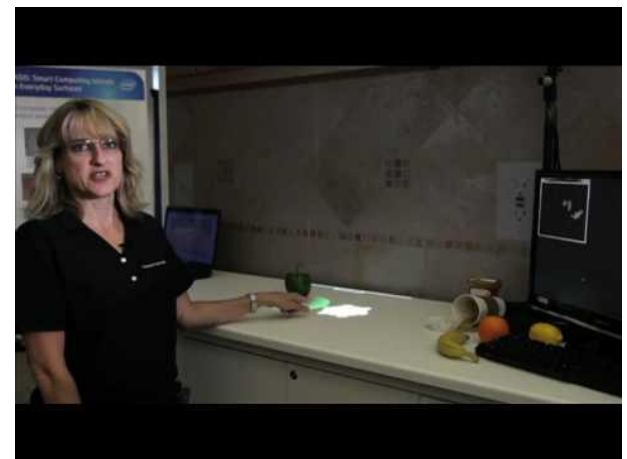
- Showcase – kommende teknologi
- Grøn uden afsavn – halver strømforbruget, uden bøvl og uden islandske sweatere, din fryser kigger på klokken
- Dematerialization – slut med DVD'er, CD'er, .. Aviser, "Beam me up Scotty" videokonf hjemme fra i høj kvalitet
- Care anywhere - tryghed, sikkerhed, wellness – huset kender dig, låser hoveddøren op og slår alarmen fra når du nærmer dig - eller åbner for VVS manden, "spiller filmen igen", checker fryseren, badeværelset leverer wellness info





Smart countertop

- Place steak and green pepper on it, and the surface lights up with recipe
- Don't like suggestion, swipe it over the edge
- Can also work as a touch screen
- A touch can bring up a timer, or images to guide on particular step in recipe
- Pico projector from Microvision, sensors from PrimeSense – suppliers to Msft Kinect
- University of Washington





Medical Mirror

- Mirror with built-in camera, measuring small changes in face color of person in front of mirror, as pulse is beating
- Can measure 3 peoples pulse at the same time
- MIT, Ming-Zher- Poh



Corporate goes mobile



- By 2015, half of the devices on corporate networks will be mobile — Gartner
- Mobile business apps flourish at IBM, Google
- Google has created an internal mobile app store

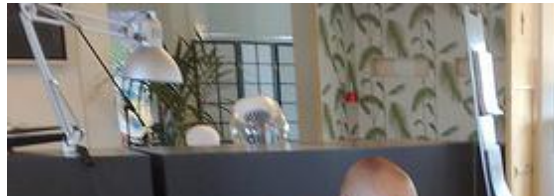
Android Split Personality

- Behaving like to separate devices, one for work and one for play
- When installed, registers with users work e-mail and takes on security policy from employer
- Can also be used to deliver content and prevent copying
- Encrypted safe area on phone, apps inside this area does not communicate with Android system but with Divide
- Enterproid, Divide



The Anywhere Enterprise

- Domicilets død?
- Multiperson activities



The Cloud Workplace

➤ Roam, Atlanta

- Members live in 10km radius
- Corporate employees (IBM), freelance entrepreneurs, small business

➤ The Hat Factory, San Francisco

- The Hat Factory is a coworking space located in San Francisco's Dogpatch
- A comfortable place to work with all the amenities, including audio-visual equipment for presentations, nearby park, restaurants, ZipCar parking and a fully equipped kitchen with an espresso machine
- 175 usd month



Immersive Telepresence & ad-hoc Liquid Telepresence

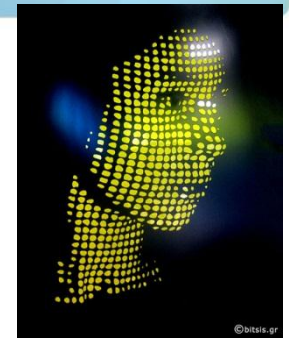
- Fra dårlig lyd ude af sync og uklare billeder til HD, og perfekt stereo uden forsinkelse



- Innovation Lab Case

- Preben reducerer business travel med 30 pct
- Liquid Telepresence på tværs af ambient wall, Telepresence systemer og personlige klienter
- Uformelt set up, INGEN guidelines fungerer bedst
- I dag er Telepresence normen, det er "underligt" hvis du skal rejse for at mødes fysisk kollega
- Remote Meeting Room, breakfast sessions





MEETING
FACE-TO-FACE
DIDN'T JUST EXPAND
MY BUSINESS.

IT HELPED MY
NEW PARTNER
EXPAND HERS.

-Judi Henderson-Townsend, Mannequin Madness



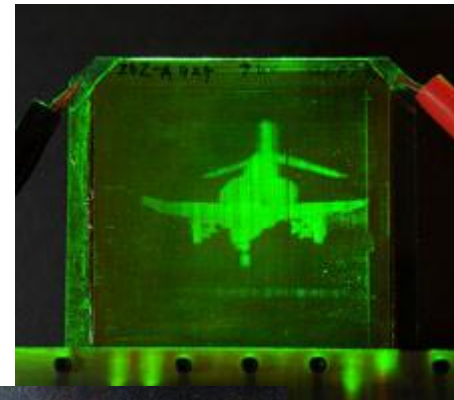
Judi Henderson-Townsend has an eccentric job: she sells and rents mannequins. So when she found someone who did the same thing halfway around the world, Judi's eyes lit up. But before she could make a total stranger her partner, Judi had to meet her - face-to-face.

Last year at British Airways, we put hundreds of small business owners in front of the people they needed to see - for free. This year we're doing it again.

To find out more visit ba.com/facetoface.

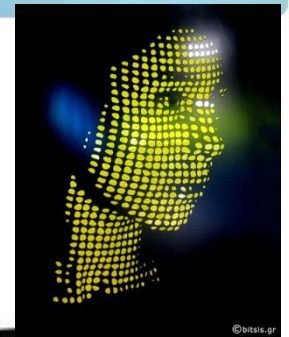
Holographic Videoconferencing

- Full color 3D display refreshing every 2 seconds
- Image appears to be projected out into space in front of the display
- University of Arizona

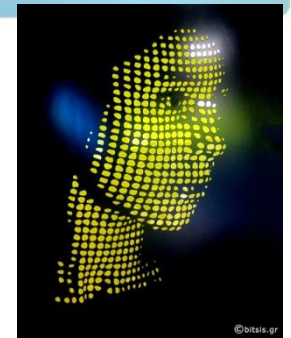


Telepresence goes CE - at home

- Cisco Umi – camera and set top box / remote control, 599 usd, service fee 25 usd/mo
- HD telepresence, ability to retrieve video messages
- Upload minimum 1.5mb, best quality 3.5mb



Remote Presence robots at the watercooler



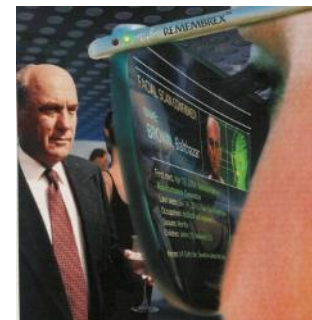
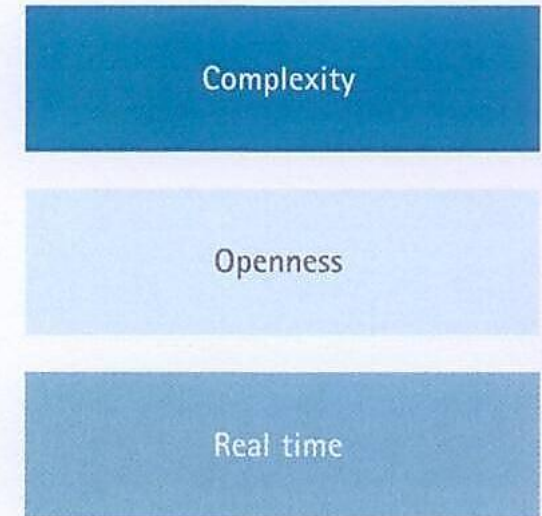
- Vgo comm's telepresence robot stands in for remote workers
- "Skype on a Segway"
- Looks like an undernourished ghost
- You can remote control and roam remote office or warehouse
- Mobility is humanizing, "after a while it is not a robot anymore"
- Bweek



Future drivers of corporate information

- Complexity
 - Generating insights from exabytes of data
 - Handling of mainly unstructured information
 - Overabundance of sources, information as a commodity
- Openness
 - Balancing openness and security
 - Mastering radical transparency
 - Supporting open innovation and collaborative value creation
- Real time
 - Enabling customer-centric real-time processes
 - Real time communication supersedes e-mail
 - Ad hoc collaboration
 - Speeding up of thinking and decision making processes

Drivers



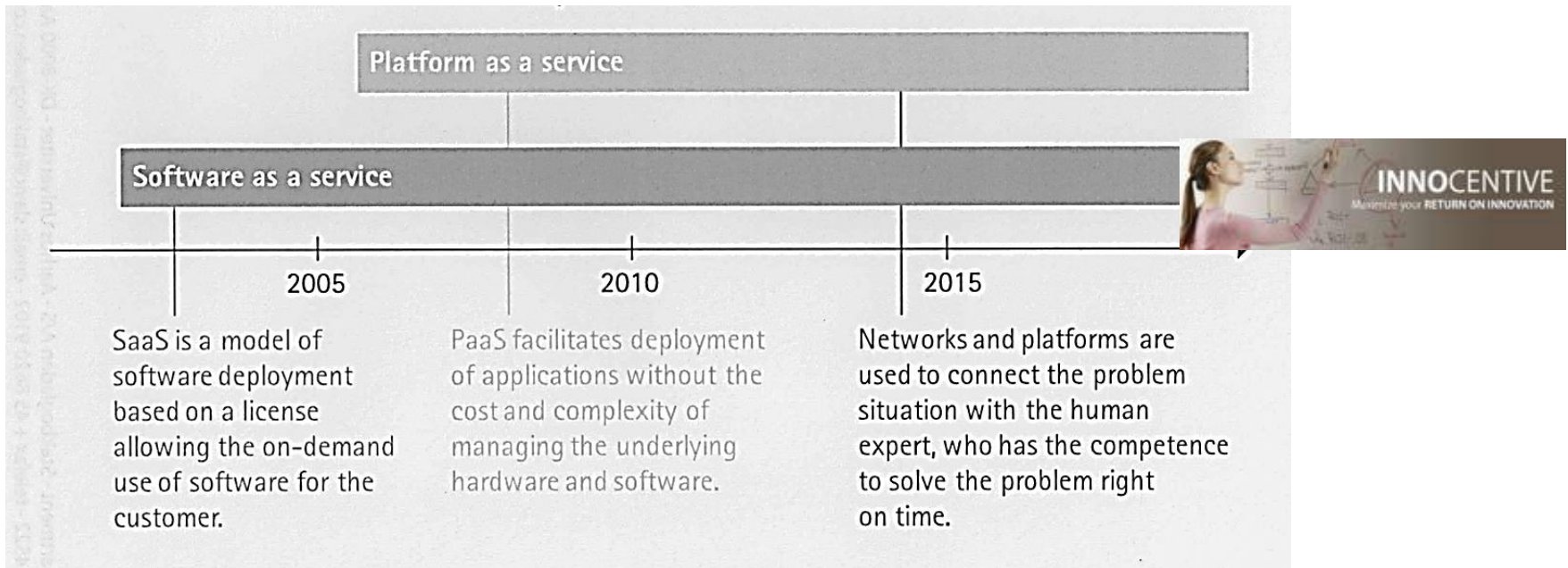
Collaboration platforms become people-centric

- Collaboration platforms will shift from document-centric to people-centric
- People centric collaboration use web 2.0 capabilities like tagging, profiling and communities
- One-to-one communications like e-mail will take smaller share of time
- Collaboration themes
 - Progressive – leveraging assets, refreshed knowledge exchange
 - Self organizing – unanticipated discoveries, peer to peer
 - Remedial – problem solving



Experts as a service

- Toward an internet of competences
- From hyperlinking documents to connecting people
- Organizations will build up a network of experts offering a range of customer and business intelligence in realtime, a hybrid cloud of human and software agents, archived and rendered data.
- Advanced profiling and matching means skill sourcing will replace crowdsourcing. A virtual army of experts 24/7. Profiling, presence management and a bidding engine in virtual marketplace is XaaS
- Where next: Humangrid and Innocentive

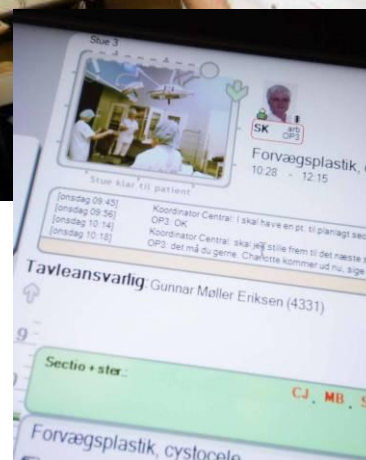


Attentional User Interfaces and Presence Forecasting



- Future e-mail and phone services help prioritizing, waiting for right time to interrupt, or whispering when something urgent pops up
- New field is attentional user interfaces
- Also presence forecasting, estimating which device to put message out on
 - Bounded deferral holding messages in reserve until recipient is ready for cognitive break.
 - IBM is working on IMSavvy, allowing messages to tap gently at consciousness, the program senses if you are away or busy typing, in future gauging interruptability by using audio sensors.
- BWeek





Fra R&D til C&D

- Innovation er Kollaborativ
- Skabe værdi i samarbejde med kunder
- Involvere brugere i innovationsprocessen
- Adgang til og kombinerung af global viden
- Etablere samarbejder i netværk og partnerskaber
- Teknologiens rolle som katalysator for innovation



- New Nature of Innovation FORA sept 2009 MM

Konklusion



- Ingen af os er downloaded, men de indfødte sætter turbo på forandringerne
- Innovation vinder ved planlægning! Og kultur-udvikling
- Innovation i Real-time med ...
- Smart Computing
 - Data i alt, fra alt, overalt
 - Sammenhæng i systemer – data i skyen, og nye forretningsmodeller
 - Mobile Future – Anywhere Computing, real-time
- Decline of phone-calls and e-mail – kommunikation som et flow
- Devices
 - Large format displays – outdoor, indoor
 - Tablet & PC's – life style tablets
 - Smartphones – the king
 - Printed electronics
- Smart-home – goldfish-level – og fra 1888. Grøn uden afsavn
- Corporate
 - Anywhere enterprise, 2015, mobile = half of devices on corporate network
 - Telepresence, liquid and high ROI, remote presence
 - Complexity, openness and real time reality mining
 - Collaboration becomes people centric
- Fra R&D til C&D, brugerne i processen og smart computing som katalysator
- Resten af dette årti er det mest spændende nogensinde i IKT
- preben@ilab.dk