Smart Home Automation

Last Mile but First Application

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[2] Smart Home – the Heat is ON

[3] Case Study – Nuitronics
will IEEE lead the way to better standardization?

[1] HOME NETWORK STANDARDS
Digital Home Network – P1905

• among all the standard bodies, IEEE seems to have an upper hand in terms of adoption
  – fixed: IEEE 802.3 (Ethernet)
  – wireless: IEEE 802.11 (Wi-Fi)
  – broadband over power line: IEEE P1901
  – Bluetooth and ZigBee RF4CE: IEEE 802.15
  – Partnerships: Multimedia over Coax Alliance (MoCA)

• current home automation standards
  – UPB, Z-wave, X-10, RS-232, RS-485
  – other proprietary protocols
P1905: fundamental advancement

• Time for a change:
  – currently, there is no single network technology for
    • applications
    • platform and
    • environment
  – must reduce time and cost for
    • simplified installation
    • maximize network bandwidth

• biggest “winner” may be BPL (broadband over power line)
  – will this be a major threat for
    • Cat6 cable?
    • Coaxial cable?
leading towards smart grid

1. opportunities for home energy management equipment and services
2. facilitates ease for government and utilities company to deploy smart grid solutions
3. home automation should lead towards a “green” lifestyle
home automation is not new but will it now be more widely accepted?

[2] SMART HOME AUTOMATION
iDA – COPIF updates on broadband enabling cables (16 Sep 2011)

- Latest update on Guidelines for Info-Comm facilities in Buildings (16 Sep 2011)
  - (2.10) Responsibilities of Developers or Owners
  - (2.11) Broadband Enabling Cables
  - (10) NGNGN

- in short: Developer or Owner (building) are now expected to be more pro-active to support and at their own expenses to facilities Info-Comm services for the licensees

- Will this lead to “catch 22” situation?
  - Some Developers are caught off-guard at the high cost of facilitating the broadband services for the licensees
  - In some countries, this become a good business opportunity

- Home owners or end-users should not be “victimized”
what is next after NGNBN?

• faster internet? yes, maybe …
  – RSP is now more up-front with their “speed” claim
  – your email is now faster but so what?
  – do we have applications that stretch the “speed”?

• YES, we see some potential trends …

1. Streaming: movie, music, others
2. Video comm: camera, skype, facetime, others
3. Smart home: control, monitor, comm, network
(1) On-Line Streaming: Movie, Music

• Content Provider’s Dilemma Solved
  – they don’t want their precious contents to be stored onto any customer’s storage disk
  – in the past, they got no choice as the download speed is too slow for real-time delivery
  – fast and real time on-line streaming is most welcome

• Now, online streaming technology and high broadband internet is conducive to Content Provider
  – is cable-TV delivery now under threat?
  – good news for NGNBN because there is killer application now
  – customer prefers movie be on-line streamed instead storing
who are the streaming players?

### Internet-To-TV Player Comparison Chart

<table>
<thead>
<tr>
<th>Feature</th>
<th>Roku</th>
<th>Apple TV</th>
<th>Boxee Box</th>
<th>Google TV</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hulu Plus</td>
<td>Yes</td>
<td>No</td>
<td>Coming</td>
<td>Coming</td>
</tr>
<tr>
<td>Netflix</td>
<td>Yes</td>
<td>Yes</td>
<td>Coming</td>
<td>Yes</td>
</tr>
<tr>
<td>Amazon</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>iTunes</td>
<td>No</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>YouTube</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Search Within A Channel</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Search Across Channels</td>
<td>No</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Search Broadcast TV</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>Keyboard</td>
<td>No</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Browser</td>
<td>No</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Resolution</td>
<td>720p &amp; 1080p</td>
<td>720p</td>
<td>1080p</td>
<td>1080p</td>
</tr>
<tr>
<td>HDMI Out</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>HDMI Cable?</td>
<td>No</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Component Out</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>Wifi</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Ethernet</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Media Player</td>
<td>Coming</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Cost</td>
<td>$80-$100</td>
<td>$100</td>
<td>$200</td>
<td>$300-$400</td>
</tr>
</tbody>
</table>

watch Netflix
61% market share
$8 per month, unlimited
download on movies

Any threat to local players?
how does streaming affects us?

TV area must cater to this new future needs.

1. put more new or extra RJ45 ports near TV?
2. more wireless connectivity?
3. more spaces for new setup box?

Open up for more content providers.

1. more foreign content providers coming in
2. local service provider will face fierce competition
3. price may drop and more marketing hype

More business opportunities.

1. new equipment sales and services
2. subscribe to more than one content providers
(2) Video Surveillance and Communication

• will IP-camera taking over Analog camera?
  – not in the near future because analog camera
    • is still cheaper by 30%-50% and picture is also clearer
    • analog system is more straight-forward, plug and play, no IP address
    • reinventing itself to HD (1080) definition
  – analog camera can also use CAT5e cables instead of coaxial cables
    *(but for HD analog, you need coaxial cable)*

• does it matter whether it is IP or Analog camera?
  – both need to be interactive and be connected to the LAN / Internet

• does it matter whether it is wireless-IP camera or fixed-point camera?
  – security hacking and installation cost are major concerns
  – picture clarity and remote play back are important
  – good security is not just on the surveillance function
will IP-Video phone come?

• analog phone may become obsolete, due to:
  – smartphone, touchscreen and tablet
  – dial picture (or icon) instead of telephone number

• older folks may find this picture-dialing more convenient and better
Days of RJ-11 and Cat3 is numbered?

- possibly but not in the near future
- worthwhile to replace with RJ-45 and Cat6 for new houses
- RJ-45 gives flexibility for phone relocation
- RJ-45 gives POE capability for IP-Phone

but RJ-45 and Cat6 are more expensive...

- yes, but it makes stock keeping and clearance easier
- get rid of old-practice and up-sell the new approach
- do it before it becomes 100% wireless home networking
(3) smart home

**Internet Access & Control**
Multiple programs allow you to control and see the status of your home from anywhere via the Internet.

**Occupancy Sensing**
Detect intrusion, automatically turn on lights, and activate automation functions when entering a room.

**Surveillance Cameras**
View and/or record guests arriving at the front door, or check on kids in the pool from any Touchscreen or the Internet.

**Energy Management**
Be comfortable at home; save energy when away. Control temperatures in greenhouses, humidors, wine cellars, aquariums, & attics.

**Entertainment**
Share your favorite music throughout every zone of your home. Even play different songs in different zones at the same time.

**Pool & Spa**
Secure pool areas with access control. Control filters, timers, heating, temperatures, solar control and more.

**Surveillance Cameras**
View and/or record guests arriving at the front door, or check on kids in the pool from any Touchscreen or the Internet.

**Security**
Professional quality UL Listed security is built-in to HAI's Omni family controllers. If desired, Lumina family controllers can integrate with an existing security system.

**Lighting**
Set warm and comfortable moods for dining, movies or entertaining. Have lights automatically turn off when leaving your home. Provide architectural quality lighting control and passive security for the lived-in look when on vacation.
Home Automation is not new ...

- home automation has been around for many years but not widely adopted, due to:
  - very high cost: equipment and installation
  - lack of standards: some are too proprietary
  - troublesome: need to work with M&E people
  - lack of support: maintenance issues
  - complex controls: too much hype
  - come in too late: after the house is renovated

- most players prefer to do building automation instead of home automation
  - bigger scale, margin and ease of implementation
Home-Auto may return for wider acceptance

we see three important trends happening ...

- Broadband
  - become norm for new homes
  - “must have” now

- wireless
  - new technologies
  - new standards
  - more devices

- iPhone
  - new life-style
  - new applications
  - connect to mobile
  - all-in-one device

- push from government and global institutes for more green initiatives
- escalating energy cost and social responsibility need to save the earth
- opportunity to connect to smart-grid initiatives
finding the key towards futuristic green lifestyle

[3] CASE STUDY: NUITRONICS HOME AUTOMATION
Typical Smart Home Concept

Nuitronics
System Architecture – Six Sub-Systems

**Goal #1**
Easy Connectivity
- 80% wireless
- 20% fixed wire

**Goal #2**
Control / Monitor
- From Home
- Away the Home

**Goal #3**
Using Smart Phone
- Anytime
- Anywhere

9th BICSI-SEA Conference 2011
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we go direct to the most influential source ...

Nutronics strongly believes that …

they hold the key to many people futuristic life-style

• Developer
• Architect
• Interior Designer
• Home-Network Designer
• Service Operator
• Government

Smart and Green Home-Automation platform is best designed and implemented during the construction or renovation phase.
our challenges

• selling the concept to a key “non-IT” group
  – Developer: impact on the budget and selling price
  – Architect: design and specifications
  – M&E: require close co-operations and approval

• finding the right home-auto suppliers
  – balancing the cost and performance
  – reliability and support

• finding the “future-proof” platform to work on

• lack of home-automation professionals

• making a complex system simple to explain

• getting into the M&E scope of works
key take away pointers

one  Know the new Home Networking standard  
(it may come sooner than we expect)

two  On-Line streaming is very real  
(Movies, Music and Entertainment are new exports of 1st world countries)

three  Home-Auto cannot use Trader  
(home automation is a complex system that requires multiple engineering and cross functional industries knowledge)
Thank You for Your Precious Time
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Building (green) Engineering Solutions
- consultation and services
- building materials