

Smart Home: Enhancing the Consumer Experience

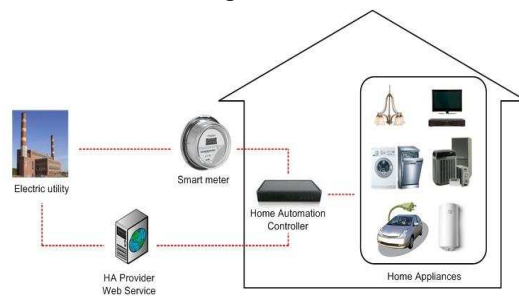
The challenge:

Driven by the global requirement to reduce energy consumption & costs, use energy more efficiently and utilize cleaner sources of energy, there are real benefits to be had from the introduction of new concepts and use cases into electricity, gas, water and heat metering systems in the home. As well as the global drivers, the consumer is also keen to understand further and to participate in the wider green initiatives. Further, integration of these into Home Automation systems and to the backend utility companies will enable the full control loop to be implemented and ultimately a stronger consumer engagement. The consumer is already conscious of expenditure and so solutions must support a lower cost of deployment and utilize the existing deployed technology where possible. Therefore support of retrofit and integration of existing home solutions is a key part in this equation.

Current challenges include the wide range of home appliances and non-standardization in device interfacing. Further lack of agreement on Home Area Network (HAN) and Wide Area Network (WAN) communication and security standards is a key issue holding up the smart meter rollout in many countries. These disparities lead to challenges in the deployment, operation, commissioning and scalability of smart energy initiatives in the home.

The challenge is to help consumers to reduce the cost of their energy consumption and create

a positive and reinforcing user experience so that these initiatives gain real traction.



The solution:

The solution put forward by i-Novi supports the key energy saving goal, the usability and interconnection of the various elements in the home and allows for scalability in the future. It considers the various stakeholders in the installation & use of this solution. From an installer perspective the solution needs to be easy to install & commission. For the home owner, low cost of deployment and operation coupled with ease of use is essential to consumer engagement. The final part of this solution is the connection back to the Utility / provider and the analytics provided by this.

These key elements are summarized below.

Interoperability: i-Novi brings skills and solutions in the integration of the various devices, such as white goods, appliances, heating and air conditioning, smart meters and home control and automation systems. Technologies in the 868MHz and 2.4GHz bands such as Zigbee, Wavenis, Z-Wave, EnOcean, 6 LoWPAN and wireless M-Bus are available in our toolbox. Wired protocols such as KNX, M-Bus as well as other standards can also be supported.

Installation/Commissioning: To overcome this we can propose a range of pairing, coordination and configuration options ranging from RFID based pairing, intuitive UI's for installers and improved network coordination concepts amongst others.

Ease of use: Providing the consumer with a 'window' into their energy consumption is required. Intelligent user interfaces via touch panels, tablets, TVs or PCs fit to this user need and having realistic use case scenarios supported which allow the consumer to use these solutions and strengthen their buy-in are critical. These scenarios can be in the form of intuitive downloadable applications to the system or features supported in the installation, e.g. location awareness and localized energy control, weather channel interfacing and modulation of the heating control point etc.

Backend: Providing a communications link from the 'home gateway' back to the energy provider will support automation of the meter reading and billing process. In addition it will provide the Utility with the analytics capability to offer customized Service Level Agreements to clients. Interaction via the smart grid where the end customer becomes a valued partner for the utility as it attempts to reduce costs and pollution and increase reliability of the demand-response model.

The system intelligence can be distributed or centralized in the main Home Automation controller.

Another aspect of the 'smart home' is in the use of intelligent sensor elements to trigger the energy consuming devices and thereby modulate the energy profile based on scenarios executing either on the home controller or sensors themselves. These sensors can be basic sensors such as PIR, Ultrasonic or Motion detectors, up to location awareness solutions utilizing off the shelf camera modules. Another emerging sensor is the *intelligent / smart outlet*, which monitors devices connected to it and can detect real use, standby use and other interim states. Another telling point is that while the push for a greener home has increased so too has the number of devices in the home, with stand-by capability. This seeming contradiction can be lessened by the rollout of smart outlets in the home. These new devices support the monitoring of energy consumption and in conjunction with the central controller running an intelligent scenario, allow for the support of real green initiatives. By combining some or all of these sensors into a network and linking to a scenario on the central controller, the consumer can further extend the range of supported scenarios. i-Novi's experiences in creating intelligent sensor solutions supported by algorithms are key inputs for the Smart Home solutions of the future.

Benefits:

- ✓ **Reduced energy costs to the consumer and Utility provider**
- ✓ **Strong emphasis on end user and ease of use**
- ✓ **Scalable solutions and a range of user oriented applications to engage the consumer**
- ✓ **Empowering the individual, utilizing the existing installed base and creating the end-end link from consumer to the utility**
- ✓ **Creating the opportunity for new business models for the Utilities and Service Level Agreements with the consumer**

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