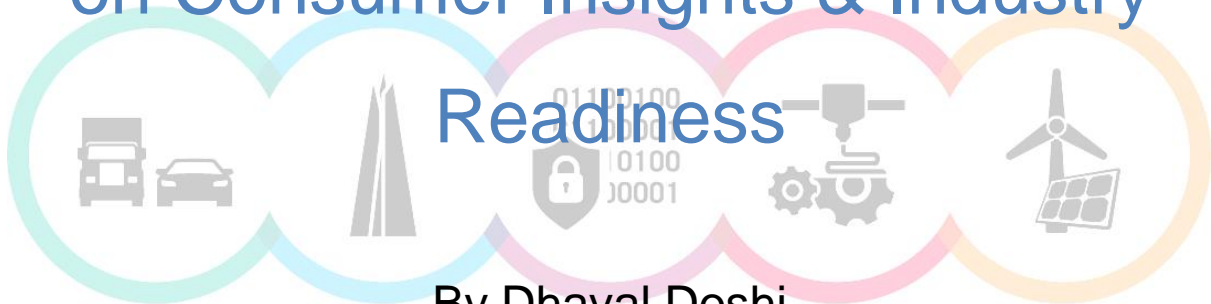




Smart Living India - A Whitepaper on Consumer Insights & Industry



By Dhaval Doshi

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Preface

The International Solar Alliance is a grand vision to bring together commitments from 121 countries to make solar energy mainstream. We, as a nation, have pledged a target of installing 100 GW of energy by 2022 through solar and with an ambitious target of reducing emission intensity by 33–35% by 2030. However, this alone is only one step towards making us a more energy efficient nation - and 'smarter' so to speak.

Another complementary area of technology is that of "Smart" solutions across the board - right from Smart cities, Smart grids, Smart governance and so on. "Smart" connected devices and applications are solutions to *not only the aforementioned problem of energy efficiency but also many other problems* - managing traffic in the city, helping states and cities make optimum utilisation of shared resources like water, electricity and infrastructure which in turn would help sustain the burgeoning population in urban areas.

While these Smart technologies are impacting the larger groups, unless the benefits are passed on to an individual person - our mission to live smarter is incomplete. Therefore, we need to talk centre-stage about how individual homes can be made smarter with effective technology and therefore become a part of the larger "smart" ecosystem. Smart homes are being revolutionised with smart speakers like the Amazon Echo and Google Home. The popularity of these devices is one indicator of how consumers are adopting Smart home solutions. However, 'voice' is only an interface that these smart speakers provide. It's the services and the solutions around this ecosystem that will determine how the home becomes efficient. Such smart devices cannot operate in silos and need to be a part of the larger ecosystem where every individual home contributes to building a more efficient Smart locality and in turn a smart city. Therefore, there is now a much greater need than ever to design Smart home solutions that are 'efficient' and truly help save energy, save time and save effort. (therefore, moving away from it being just vanity for our homes).

This white paper is a 'micro perspective' in that subject area of "Smart living". A typical urban Indian has his phone with him right from the moment he wakes up with the first sip of tea to the moment he switches off the lights for bedtime. The home internet of things revolution is the next inevitable wave of disruption but it needs an impetus by way of product innovation, industry collaboration and consumer-centric design thinking.

Objective of this Whitepaper



While the basic premise of this white paper is to bring forward basic concepts of “Smart living” and give direction to existing and new industry players as well as other stakeholders; the underlying objectives are multifold. Just as the internet changed the way we live our life, the advent of Internet of Things, Artificial

Intelligence, Machine Learning together will change every facet of our everyday life. This Smart living white paper helps elucidate and make sense of this grand vision of the future which involves not just multiple technologies but also how they work in congruence to achieve a brighter future for us. In that context, the objectives are:

- Develop a broad understanding of “Smart living” and what the concept entails
- Bringing forward the scope of Smart living for various stakeholders
- Bring awareness on global innovations and engineering excellence
- Highlight key channels to establish industry-consumer connect for Smart living
- Broad assessment of the Indian ecosystem of Smart living
- Recommendations and reforms to industry and government to accelerate adoption of Smart Living solutions

Smart Living: Definition & Scope

Smart living entails the lifestyle of an end user where he or she is interacting with connected technologies to help achieve his or her goals in day-to-day life in the most efficient way - by either reducing time, money or effort. In addition, making our life more convenient and secure.

The use-cases and technologies involved in a 'smart lifestyle' changes as the user moves from one place to another or when his or her role changes. For example, a smart homeowner who wakes up at 6 AM will have his coffee ready for breakfast at 6:30 AM because his smart coffee machine knows when he got off his bed. On the other hand, when he or she books a cab via Uber, GPS technology is used to find the most optimised route which will take him to work. Here's the technology at play extends outside of his home ecosystem. In addition, while he is at work, occupancy sensors turn off the lights in conference rooms when he is done with his meetings.

In other use-cases: a student uses interactive whiteboards to present his project in the school, a doctor using technology for telemedical assistance to treat patients from thousands of miles away. Therefore, there is an entire spectrum of technology solutions that help save energy, save effort and save time for the end user. This includes every connected device, appliance or network that can help achieve either of the three objectives mentioned.

The scope of Smart living involves the end user (consumer) of these technologies:

- 1) A resident
- 2) A patient
- 3) A student
- 4) A shopper
- 5) An employee or a worker at an office

While there are other areas like smart energy, smart governance, smart agriculture and smart mobility which also form an integral part of "smarter" living - they are excluded from this white paper as they are focussed more on macro problems which are generally solved at scale and are therefore best discussed in context of 'Smart cities'.

Stakeholders and Value chain

In the "Smart Living" ecosystem, there are several stakeholders at play. These stakeholders are primarily divided into two categories: users and providers.

Users:

Residents or homeowners: These users are primarily spending their time at leisure or doing household chores. Typical challenges include saving on energy bills, reducing their home's carbon footprint, saving time on doing mundane or repetitive tasks and chores, finding newer ways to entertain themselves at leisure and so on. Today's evolved consumers are not just looking to build beautiful homes but are also looking for more efficient homes.

Corporations and Small Businesses: Commercial spaces like offices, factories, shops, workshops and showrooms have small and large teams working for long hours. While there are many business objectives of saving energy and saving cost; more and more offices also grapple with employee productivity and retention challenges. Therefore, it becomes pertinent that they invest in technologies that help in the same.

Patients: In a way, any and every individual seeks to lead a healthier and happier life. While there are typical challenges of a fast-paced lifestyle that require us to be fit - mind and body; there are challenges of accessibility when it comes to patients in remote areas. Moreover, in India due to our population problem, we also struggle with efficient, quality healthcare in hospitals. Hospitals are adopting newer ways to store patient information; doctors are using technology for making appointments easy and reducing wait-times. Consumers, on the other hand, are using wearable technology to keep track of their heart, stay fit and share their vital stats with family members across the world.

Students: Students in schools and colleges are now working with new technologies to help augment their learning experience. Be it interactive classrooms or collaborative online tools that bring the student and the teacher for better feedback mechanisms, students consume vast amounts of technology. The affinity to use technology is very high among these users as they have grown up using smart phones and touchscreens.

Shoppers (or consumers): With ecommerce, the entire purchase process has changed for a consumer. Comparative shopping has become pertinent for shoppers as they try to find the best deal for the best brand - be it online or offline. Moreover, e-commerce is struggling in certain categories like furniture, apparel. Therefore, the consumer journey often starts online and ends with an offline purchase. Consumers are looking for more variety than ever and therefore the research process has become very intensive and fast. Therefore, they use online comparison engines, shopping portals and even use online coupons for offline purchases. They are now even able to book a slot in the queue when it comes to grocery shopping.

Providers

Smart Device Manufacturers: Smart device manufacturers across India are taking advantage of the reducing cost of hardware and the open-source software platforms available to build solutions that are focussed on the Indian consumer market. This has led to a plethora of options for the consumers to build a smart home. However, the lack of standardisation in connectivity protocols, lack of consumer awareness, lack of consumer-centric design as well as typical challenges of the startup ecosystem make it difficult for some of these manufacturers to make a dent. On the other hand, large tech companies like Amazon and Google are focussing on the DIY market which helps the case of building consumer awareness and bringing some standardisation in the ecosystem. However, those devices alone cannot enrich the entire home user's experience. There are several aspects that need to be personalised and need a deeper technical expertise.

System integrators: Service providers in the form of individual consultants, small businesses and established companies play the crucial role of helping an individual consumer design, implement and configure personalised smart living experiences in homes and offices. System integrators are often specialists in specific technologies, brands and domains. For example, a system integrator who deals in wired smart home solutions by Crestron and specialises in Audio Video solutions for homes. System integrators play a critical role in providing the hand-holding that the consumer needs. However, often times they can only offer limited brands and suggest solutions that are limited to their area of expertise.

Telecom companies, network providers, cloud solution providers and other communication services enterprises: In our bid to become the world's largest network of connected individuals, telecommunications companies and network infrastructure companies need to collaborate more than ever for the benefit of the consumer as well as to achieve their organisational goals. The sheer lack of standardisation of protocols is one major hurdle that requires companies to collaborate. Moreover, there is a need for telecom companies to work closely with device manufacturers to allow mass adoption of IoT devices with innovative business models that make these solutions affordable for consumers while also allow manufacturers to reach to every remote market.

Software Developers: The services layer of the Smart living initiative - be it the software that lets you monitor security feeds or an augmented reality app that makes it easy for someone to view a 3D version of the product they want to buy, this is only made possible by the developer community. Thanks to APIs and SDKs made available by companies like Amazon and Google, one can develop apps (or skills) that can help consumers get more from their existing hardware and solutions. There is a need for more developers to enter this domain of Smart living and build ecosystems and APIs around the platforms being built on top of the smart devices. India definitely needs more indigenous platforms on which the developer community can thrive and innovate and build solutions that are meaningful to consumers.

Construction professionals: Architects, real estate developers and other construction industry professionals: Smart solutions are required to work in environments that are conducive in terms of design. In that context, therefore the construction industry plays a pivotal role in ensuring that the

design, construction and implementation of spaces allow for installation of technology that is not only efficient but also intuitive. The recent partnership of Amazon Echo with Embassy group to launch Amazon Echo enabled Smart homes is a good example of how the construction industry is collaborating with tech companies to bring out a comprehensive solution for homeowners.

Healthcare professionals and related Industries: Doctors, MedTech companies, pharmaceutical companies, medical equipment manufacturers: Healthcare professionals and institutions are embracing the Internet of Things revolution by the implementation of prototypes and pilot projects are being undertaken to solve many problems. For example, software for doctors to manage the huge volumes of data of patients as well as taking appointments are becoming more mainstream in urban areas. In addition, doctors are also using 3D printing to make dental dentures or even prosthetic limbs. While this is at a nascent stage in India, there are several case studies globally that are leading to the perfection of these technologies and will eventually come to India.

Education Professionals and institutes: Education professionals and institutions that adopt virtual classroom tech, cloud servers and smartphones to aid efforts of teaching and enrich teaching methods are growing. However, there are still large gaps in terms of access to good quality education. The internet alone cannot solve this problem. There is a need for smart devices and comprehensive teaching solutions that can be propagated to remote areas with the support of high quality faculties. Some startups and education companies are using live streaming technology to bring education to villages and remote towns. This has interestingly also led to newer employment opportunities for faculties and has led to a growing trend of remote teaching and mentoring.

Retail & Ecommerce: Shop Owners, small businesses that sell to end consumers are rapidly using tools like ePOS, wallets in order to transact with a digital first audience. However, with the advent of platforms like Amazon and Flipkart, a small shopkeeper and trader are also able to scale his business and reach millions of consumers. This has been made possible on the back of the internet of things at play at the back end of these ecommerce behemoths that allow for managing inventory better, optimise order delivery and ensure timely delivery to the end consumer.

Value Chain

As with any new technology, comes a need for new skill-sets and talent. Interestingly, in the area of Smart living, the value chain is such that it not only requires new skills but also a new collaborative mind-set to make the vision for the end user a reality.

Typical Value Chain in the Smart homes Market

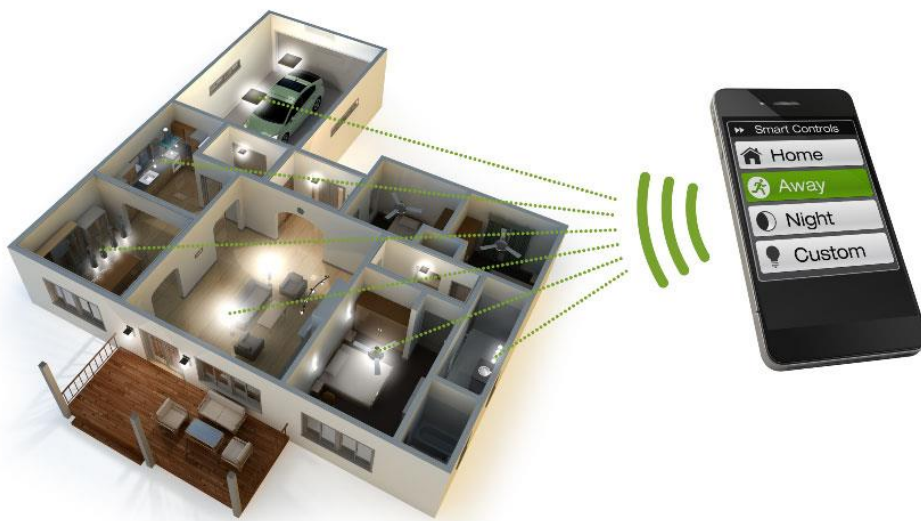
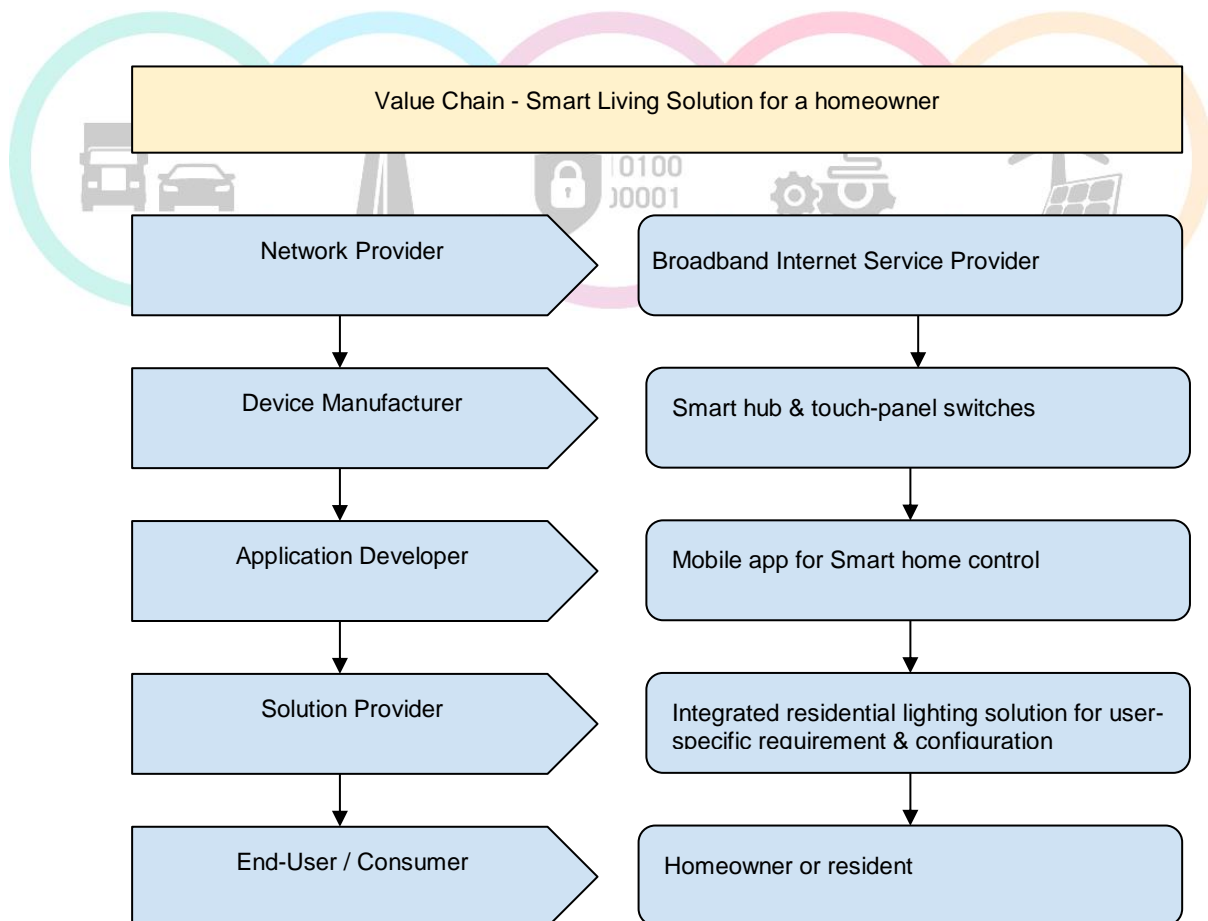


Image Source: blog.nxp.com



Typical Value Chain in the Smart healthcare Market

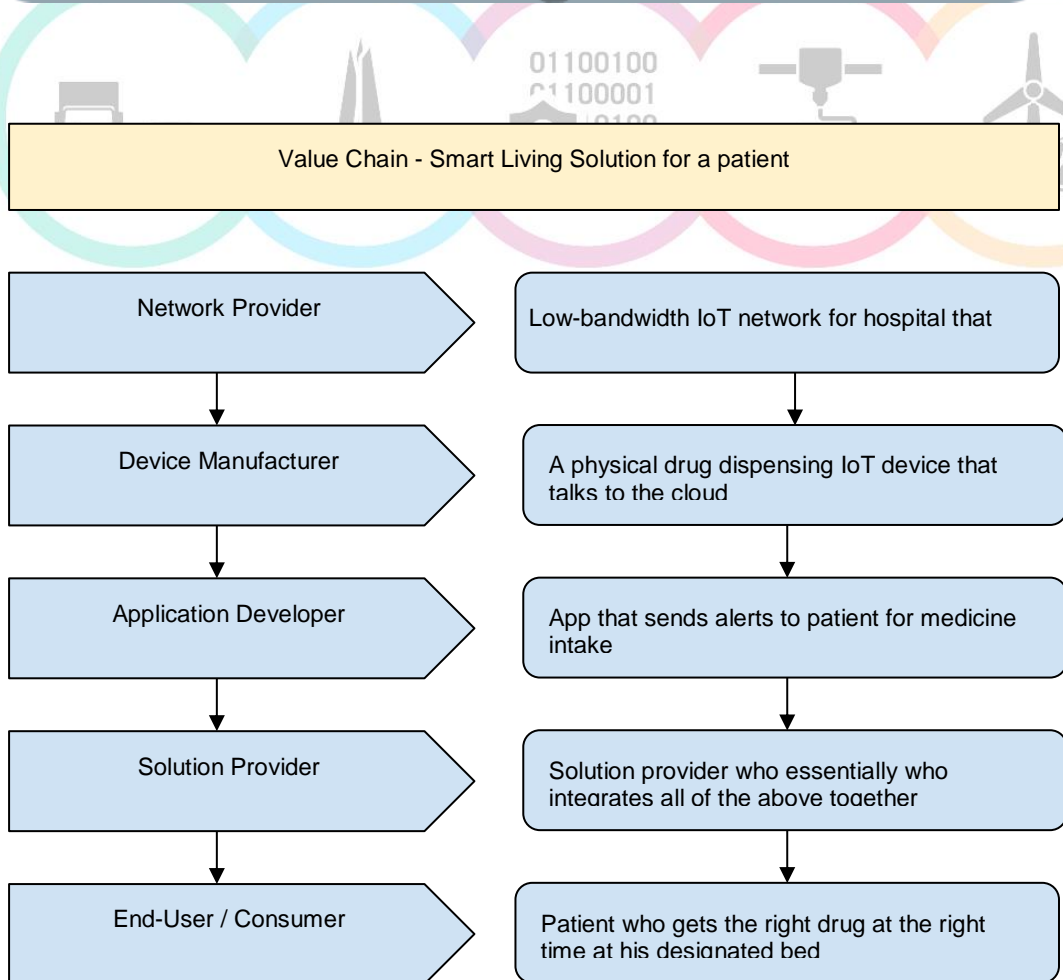
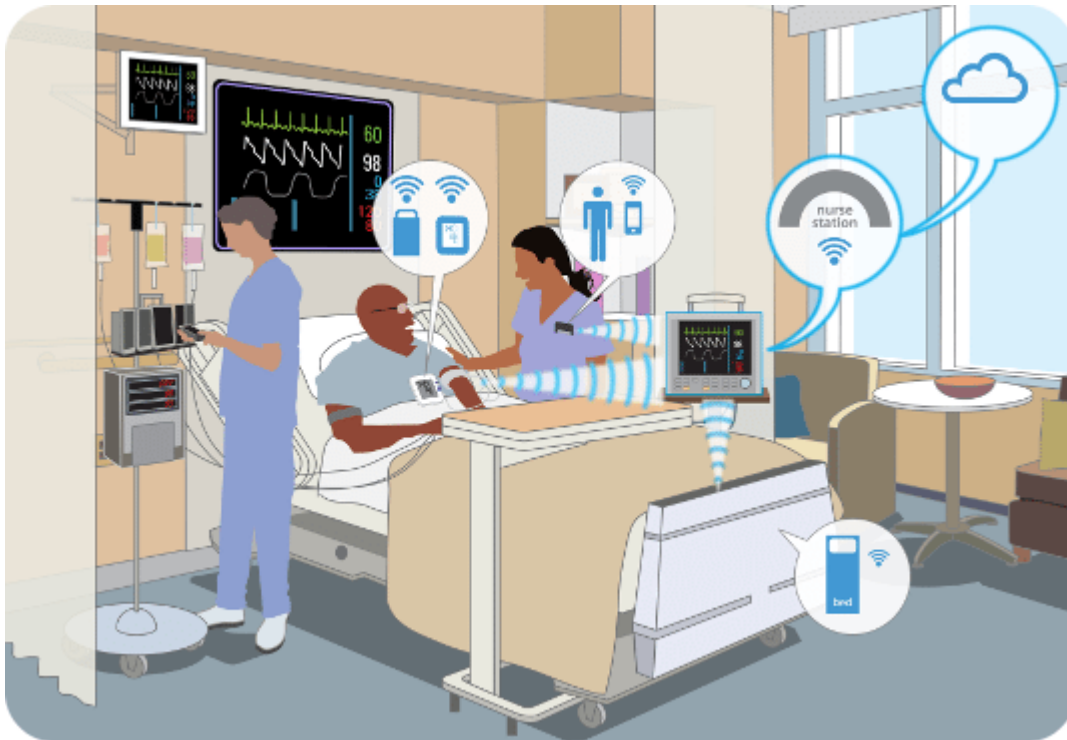


Image Source: <https://www.informationscuritybuzz.com>

Technical Outlook

There are multiple technologies involved when it comes to making a Smart living solution a reality. Below is a brief introduction to them:

Networks:

Networking Layer Comparison

	TCP/IP Protocol Stack	Z-Wave	ZigBee	6LoWPAN
Application	HTTP, RTP, FTP, etc.	Device & Command Classes	Application Profile(s)	HTTP
Transport	TCP, UDP, ICMP	Routing Layer	Application Support S...	UDP, ICMP
Network	IP	Transfer Layer	NWK Layer	IPv6 with 6LoWPAN
Data Link	Ethernet MAC	Proprietary MAC	IEEE802.15.4 MAC	IEEE802.15.4 MAC
Physical	Ethernet PHY	Proprietary PHY	IEEE802.15.4 PHY	IEEE802.15.4 PHY

Image Source: <https://opentechdiary.wordpress.com/>

The fundamental building block of any connected solution is the connectivity itself. The sheer scale of Smart solutions requires for a communication layer that is more stable and versatile. Therefore, there are protocols including Zigbee, Z-wave, Lora and others that have come up. These networks are not rendered useless when the internet connectivity is compromised; therefore they are important in the context of the Indian market where smart solutions could also work in areas that do not have internet access.

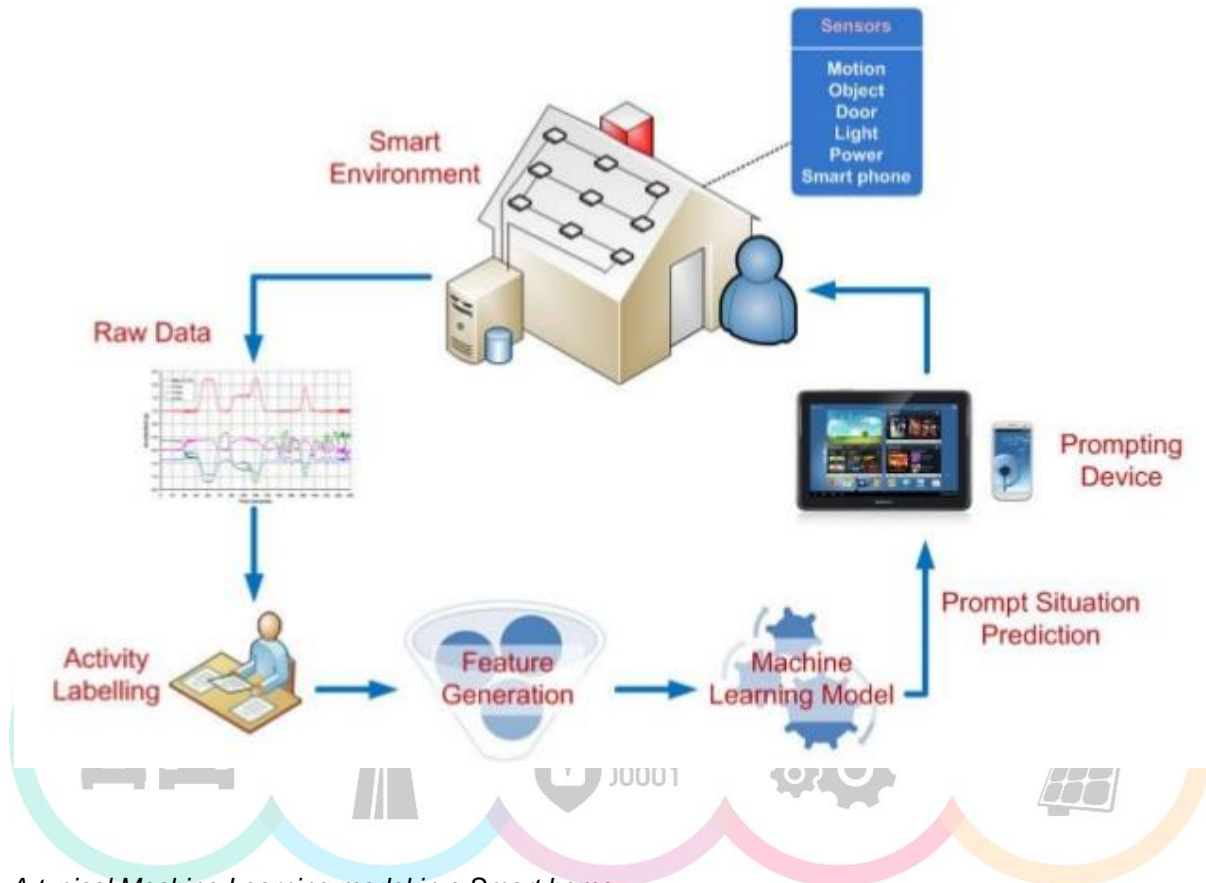
Things (Devices):

The Internet of Things needs Things that are intelligent. For example, a smart bulb typically should be able to do far more than simply illuminating your home. These smart bulbs can do many other things; like mood-lighting through light dimming, colour changing and so on. In the same way, a typical smart watch is expected to do a lot more than a simple wrist watch with features that track your health, help you answer calls and so on.

Artificial Intelligence:

Artificial Intelligence is what enables the Internet of Things to do much more than what is expected from a typical computer. In that context, AI is a constant learning, human-like intelligence that not only assesses a scenario but acts upon it based on past learning. Therefore, in that context AI can automate our lifestyle.

Machine Learning:



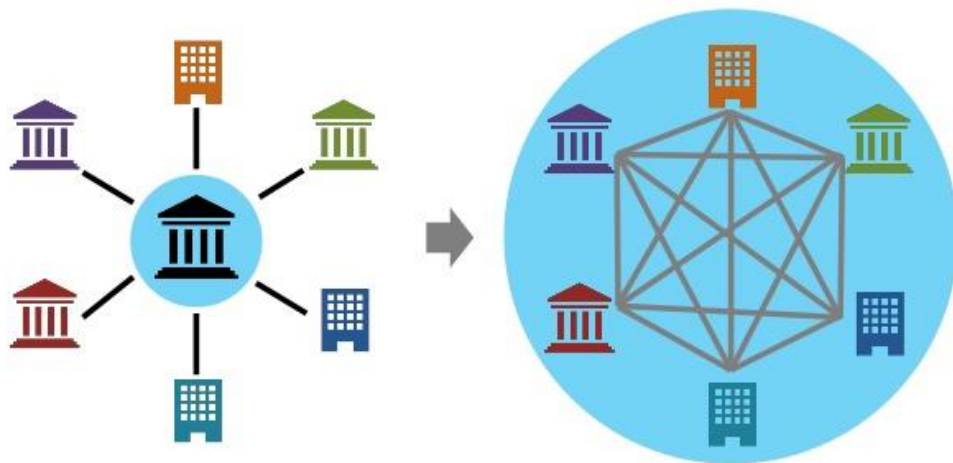
A typical Machine Learning model in a Smart home

Image Source: <https://www.slideshare.net/barnandas/machine-learning-challenges-for-automated-prompting-in-smart-homes>

Fundamentally, machine learning is a subset of artificial intelligence in the field of computer science that often uses statistical techniques to give computers the ability to "learn" with data, without being explicitly programmed. Take, for example, when you reach home, the temperature of your bedroom is automatically set to your comfort as your Smart home knows exactly the right temperature you prefer based on your previous settings. Moreover, it also turned on the air conditioning just in time based on your commute time as well as the time needed to cool your room.

Block chain:

Blockchain is about Distributed Trust



Difference between a typical centralised bank and a block chain network of peer to peer transactions.

Image Source:

<https://www.slideshare.net/LegalHackersBXL/20170620-meetup-intro-to-blockchain-and-smart-contracts-1>

Blockchain is a very hard concept to explain as a small segment of this white paper. However, to put it simply it is a decentralised (distributed), trust platform. By definition, it is secure and would combat fraud by way of smart contracts. There are even use-cases of blockchain even in a Smart home setup where an individual blockchain in a Smart home can validate devices and ensure the security and privacy by ensuring only trusted devices can work within the network.

Barriers to Smart Living

There are several challenges plaguing this industry. Some of them are due to the infancy of the market life cycle. However, significant the barriers are also due to insufficient collaborations and innovations which will help us leapfrog in terms of adoption of Smart living technologies.

Awareness Challenges:

One of the biggest barriers for the industry today is the lack of awareness of Smart living solutions not just with the consumer but across the value chain. Unfortunately, the Smart living solutions value-chain find it challenging because of the nature of the product category being highly technical. For example, the smart lighting or home automation solution provider was earlier the seller or distributor

of LED lights. Therefore, those same dealers of lights and fans are not equipped to sell integrated solutions that are not off-the-shelf products. Therefore, a new breed of 'system integrators' work closely with the manufacturer to understand and be able to sell these solutions to end customers. This segment is fairly small but growing.

Most of the system integrators are in the security solutions space (think CCTVs) and the Audio-Video Solutions market which is targeted towards the elite consumer. There is a need to spread awareness of Smart living solutions through upskilling activities which will help new businesses to flourish and allow old-school businesses upgrade and sell more specialised Smart living solutions.

Adoption Challenges:

Lack of awareness is one of the key reasons for low adoption of Smart home technologies. The irony, on the other hand, is the fragmented market of products and services. For example, if one were to set up a smart lighting solution for their home, there are at least 15-20 different brands and at least five different technologies or platforms on which they operate. Therefore, this makes it very overwhelming for a consumer to take a decision. What's more is that the price for the same varies from a meagre Rs. 20,000 solution to an Rs. 20,00,000 depending on feature differences, the product's built quality and the controllers being used. One can go on about the adoption challenges for the consumer or the end-user.

Lack of Standardization:

For a lack of standardisation in the Smart living product category, there are many interoperability issues. For example, if you buy a specific Smart home gateway, it may or may not work with different peripherals available in the market. This is because they operate on different platforms. In that context, this makes the decision making for the customer harder and even more overwhelming. Often times, they get boxed out of many innovative solutions available in the market as it may not be compatible with their existing Smart home ecosystem.

Lack of network accessibility:

India is marred by accessibility issues. However, the problem is multifold when it comes to network access for Smart solutions. Because of a lack of standardization, the network providers, software developers and device manufacturers do not have a clear direction as to the right platform to build for.

Lack of home-grown Product Innovation:

As is the case with other technologies that have become mainstream in India, Smart living solutions available in India lack customisation and customer centricity. Many of the solutions are built to 'automate' the Smart home with interfaces like mobile apps and smart speaker connectivity (Alexa-enabled, Homekit & Siri enabled & Google Home enabled). However, beyond that, there are no features which help in saving energy, saving effort or saving time. For example, smart vacuum robots



that are a growing category in India is dominated by imported products which are not necessarily optimum for Indian homes. In the same way, there are a variety of problems in Indian homes which can only be solved with customer centric design.

Benchmarks & Inspiration

An Energy monitoring device that is simple:

Smart living comes with smart decision making. However, decision making requires data. There are several examples worldwide about how a consumer can live smarter and save energy by having information about his day-to-day energy consumption. In a study conducted amongst smart homes in China, it was found that when that homes that had an in-home display would often consume lesser energy compared to those without an in-home display.¹ In addition, they also ensured their electronics are kept in check - to ensure they are working efficiently. This was possible with the real-time information available to them.

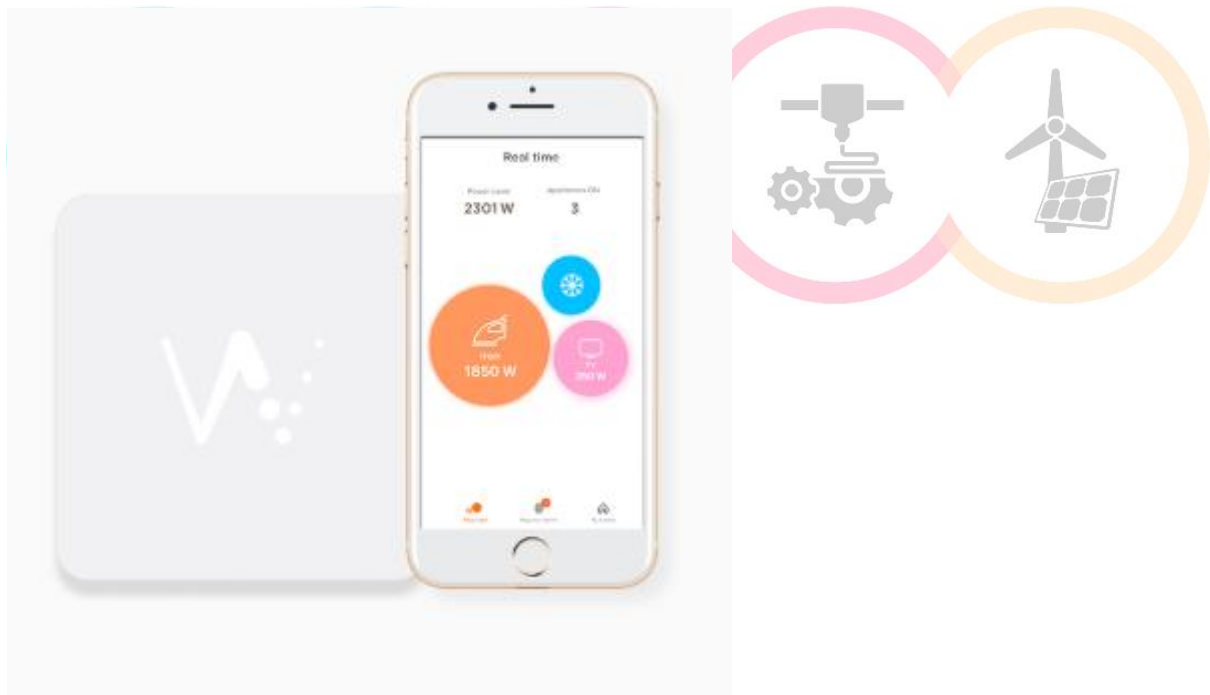


Image Source: watty.io

Watty is an AI-driven box that rests in your home and gives you all your energy information on your smartphone with an accompanying app. This is a Swedish start-up that has simplified this process of accumulating the energy consumption data of your home and has gone a step forward by providing insights which are simplified:¹

¹ <https://www.sciencedirect.com/science/article/pii/S0301421517300393>



Image Source: Watty.io

Smart health Ecosystem in Singapore:

Singapore is a shining example of an integrated Smart living ecosystem. Thanks to 80% of it's housing being in the public sector; the governance and implementation of the same have been far smoother compared to other countries. In addition, the encouraging of private players to provide trials to consumers has gone a long way in making the nation truly smart. Another distinguishing aspect of the implementation of Smart living solutions in Singapore is the fact that there is clear synergy across the entire value chain - right from manufacturers to the services layer. Take for example, the Health Hub. The Health hub is an online portal, a mobile app, backed by data from the entire public health system. In order to enable continuity in medical healthcare, the health records of all patients are available centrally. At a micro-level, tracking data of each individual is available to him on his app and he can also be a part of a community of health events that happen around his locality. This makes for an effective and a robust smart health management for all citizens.

A Smart security solution that does not need WiFi:

Manufacturing and product design is not always about introducing the latest feature but an integration of technology based on consumer needs. For example, Igloohome launched a unique locking solution which is essentially a key box. The key box itself hangs on the door and can store physical keys inside it. In order to access those keys, one needs to use a pin code which can only be used once. This innovation works without internet or wifi and does not require one to reconfigure the door, yet giving a smart security solution to a homeowner.

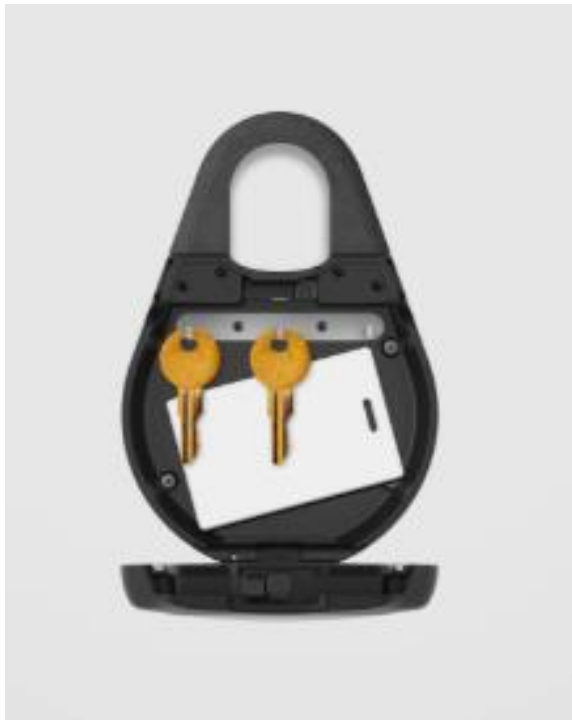


Image Source: www.igloohome.co

A Smart speaker called the "Amazon Echo":

The most innovative product that has gone mainstream in recent years is the Smart AI speaker. An assistant which activates on voice has revolutionised how we access music, set reminders and even hail cabs or order a pizza. While this device may be at a nascent stage when it comes to a Smart living ecosystem, what needs to be noted here is the 'ease of use' and the establishment of an ecosystem altogether - it is not just a smart speaker - it has a layer of services built on top of it by developers who have created hundreds of thousands of skills that activate and engage with consumers for every possible use they might have. The innovation is central to the Smart home because it is far simpler to talk to your home and switch off the lights rather than having to lift your Smartphone out of your pocket and access an app.



Image Source: Amazon Echo



Image Source: sony.jp

Aibo - an emotionally intelligent pet dog:

Aibo can recognize faces, display emotions and even act up when not pampered. With a dog that is not only technologically advanced but has a way to provide support emotionally to its owner, this is a huge leap in AI technology. Such technologies go beyond just adding convenience to our life by enhancing it with experiences which we have never had before.

Recommendations

Smart living technologies are at a very nascent stage in India. Our nation has a vast consumer base riddled with a multitude of problems right from basic issues like energy accessibility all the way to achieving efficiency through a renewable source of energy. Smart living technologies can play a pivotal role in solving these problems. Solutions that are built on Artificial Intelligence, Blockchain, Internet of Things, Machine Learning, Computer Vision and other related areas can play a pivotal role to solve a variety of problems. However, the industry can expedite the adoption of these innovations by building technology that is effective and aligns with the needs of the consumer.

Companies should take a Problem-solution focussed approach to Innovation:

In order to make smart living mainstream, manufacturers need to build products based on the identification of problems of its target audience. Designing products riddled with features may not be the solution. Rather, a single feature which focussed on a single problem and solves it is better.

In that light, we need to identify the evolving customer needs. An urban consumer nowadays is not just looking for a well-designed home but also a functionally efficient one. While Smart homes present an immense opportunity for this customer, are we designing solutions based around his typical challenges of having a functionally efficient home? Typically, he is not looking to save energy but also adds more convenience to his lifestyle. There is a growing trend among millennial couples where both the husband and wife are working; however, they are not having any kids but are rather having pets. In such a scenario, there are immense applications of smart living solutions which would help them monitor pets when they are out working at an office.

In the same way, there is a growing trend of elderly parents staying apart in their hometown while the son or daughter is working in a metro. How can one find ways to implement monitoring and emergency response mechanisms to help their parents in times of distress? Smart Living solutions designed to solve such problems would help in making their adoption easier.

Industry needs to come together to solve the problem of 'lack of awareness' when it comes to system integration:

Today, more than ever there is a need for solution providers or experts who can integrate Smart living solutions together for the end-user. The sheer fragmentation of the market makes it very challenging for a consumer to understand, decide and moreover install solutions. India is not a DIY (Do it Yourself) market and if one were to go for DIFM (Do it For me) solutions, there are few specialists in the market who understand Smart living technologies well. This is because the process of technology adoption is multiple compatibility concerns, design understanding, product understanding and a continual learning of new products that are being launched in the market.

Therefore, the typical small business owner who is selling electrical hardware is not well-equipped to provide this system integration service. Manufacturers are therefore struggling to fix this distribution problem which can only be solved when more system integrators who are savvy and technically sound join the industry.

There is a need to upskilling, training and building a community around these system integrators who will work closely with manufacturers to ensure continual learning and distribution of these products.

Consumers should take interest in educating themselves:

End users in India are mostly exposed to the one most common technology product out there i.e. Smartphones. Unfortunately, when it comes to Smart living, there is a misconception that it is only meant for the elite. Many consumers are unaware of the advantages of using Smart living

technologies. Moreover, the process of research can get very overwhelming because of the lack of accurate information on the internet and the complicated technicalities involved in the process.

In that context, it becomes all the more necessary to educate them about this technology but in a simple and easy-to-understand manner

Industry needs to create interest among the Developer Community:

The hardware and the platform is just the tip of the iceberg when it comes to adopting Smart living tech. What it finally comes down to is the service that you use with it. For example, the Alexa skill that you use in order to remind yourself about your insurance premiums could be built by ICICI Lombard. However, this requires immense interest from the developer community. More and more coders need to work on top of existing platforms like Alexa or Homekit so that more services can be availed for local service providers in India.

There is a need to build more platforms that are multilingual to make Smart living technologies mainstream in India. Therefore, the developer community plays a critical role in ensuring that the service layer is inline with the requirements of consumers in India and so that they can make the most out of their Smart devices and ecosystems.

Government and Industry needs to collaborate:

The government's ambitious plans in the Smart cities space need to be backed by private player participation even at the micro-level. Therefore, more private players need to work in integrating smart living solutions at a home, educational institute and a hospital to work in congruence with connectivity, data centres and apps that are being built for the city.

Public and private collaborations can go beyond just Smart cities and can also lead to solving governance and efficiency problems. For example, a private player working on a large scale hospital can work closely with a municipal corporation to spread awareness of an epidemic or to conduct timely health tests. This data can also be further used to improve that individual's health by use of trackers / smart wearables that would share this information.

Innovative business models through collaborations across the value chain:

Collaborations between a manufacturer, a system integrator and a service provider are crucial right from the stage of product development and not solutioning. This will lead to more companies innovating the way Smart living technologies are provisioned. Is it possible for consumers to hire Smart living technologies as they use rather than making an outright purchase? It could also lead into a 'service' model.

Several challenges of pricing, distribution and adoption can be solved through collaborative efforts of the industry across the value chain.

About IET India

The IET is one of the world's largest engineering institutions with over 168,000 members in 150 countries. It is also the most multidisciplinary – to reflect the increasingly diverse nature of engineering in the 21st century.

The IET is working to engineer a better world by inspiring, informing and influencing our members, engineers and technicians, and all those who are touched by, or touch, the work of engineers. The IET office started operations in India in 2006, in Bangalore. Today, we have over 13,000 members and have the largest membership base for the IET outside of the UK. Our strategy is to deliver activities that have an impact on overall competency and skill levels within the Indian engineering community and to play an influencing role with industry in relation to technology innovation and solving problems of public importance.

We plan to achieve this through working in partnership with industry, academia and government, focussing on the application of practical skills within the learning & career lifecycles (particularly early career), and from driving innovation and thought leadership through high impact sector activities.

The technologies that we have chosen to focus on are:

- a. The Internet of Things (IoT)
- b. Future of Mobility and Transport

To drive this focus forward, we have created volunteer-led panels for each.

The IET IoT Panel

One of the most important technologies that will connect all sectors will be Internet of Things (IoT). With 1.9bn devices expected to be connected in India alone, by 2023, IoT and related technologies assume relevance of significant proportions. Across sectors we will see energy, power grids, vehicles, homes, entire cities and manufacturing floors, computers and mobile devices being connected.

Leveraging its position as a multi-disciplinary organisation, IET India launched its IoT panel on February 20, 2015 with Dr Rishi Bhatnagar (President – Aeris Communication) as the Chairperson. The panel, being a first of its kind in India, focuses not only on technology but the application aspect of IoT in various segments.

The focus is to facilitate discussions that will help in making the inevitable connected world more efficient, smart, innovative and safe. It will focus on technology, security and regulatory concerns and the need for nurturing capabilities and talent for a quicker adoption of IoT in all spheres. The panel also constitutes sub panels / working groups focusing on the application of IoT in Agriculture, Retail, Energy and Healthcare domains. Each of these sub panels will work towards undertaking neutral pilots and studies and publishing white papers around the application of IoT in the respective domains.

The IET India IoT Panel will provide a platform for stakeholders to participate in becoming an authoritative, but neutral voice for the evolving movement of IoT in India. It aims to enable all the IoT practitioners (including people from the hardware – devices, portables, sensors, software, business) and IoT enablers (including people from regulatory area, training area, investors in IoT, end users) to work together on relevant areas to make this industry efficient as well as robust. The panel envisions laying a solid foundation by supporting policy makers, industry in the next step of adoption of IoT.

The panel works through Working Groups - Healthcare, Social Impact, Telecom, Smart Living, Skills, Standards, Regulatory & Legal, Cyber Security, Ganga Rejuvenation and Energy.

Read more on <http://www.theiet.in/loTPanel>

If you are interested in volunteering for the IET or joining one of our panels, please write to us at india@theiet.in

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