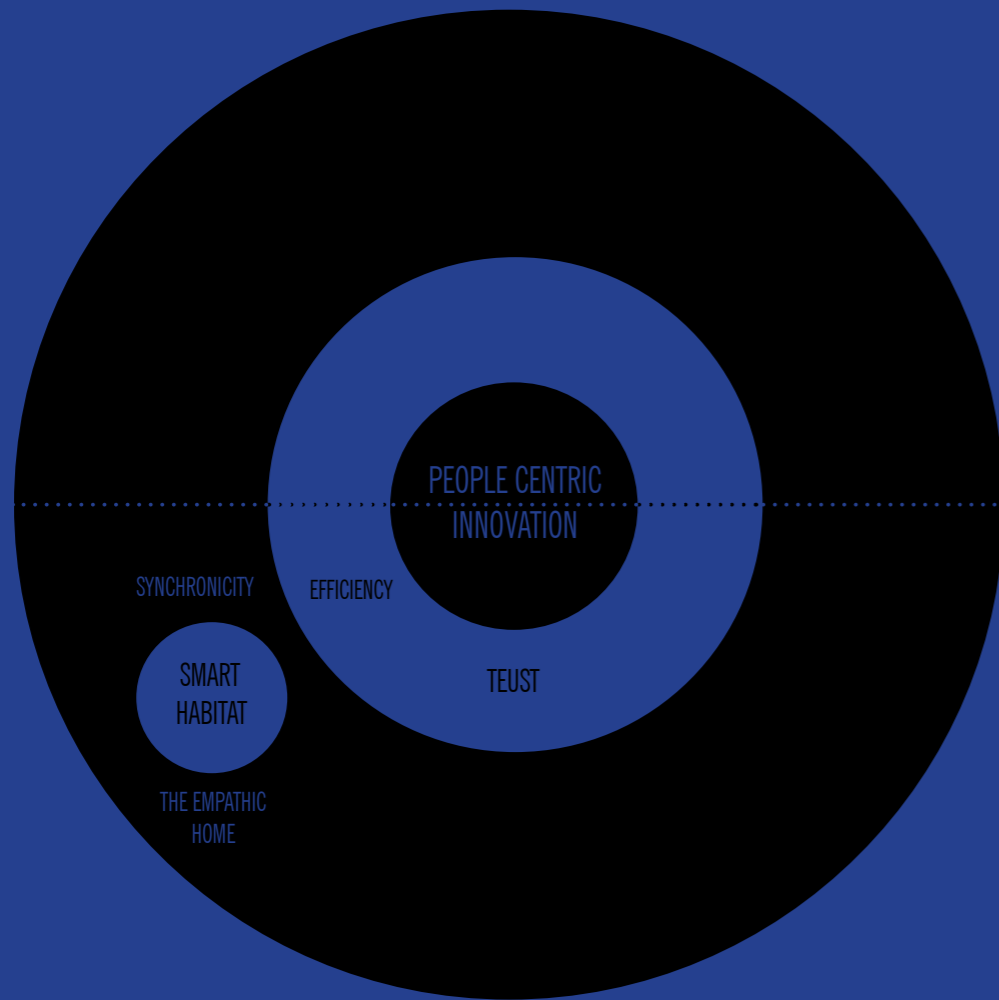


SMART HABITAT



NEED STATES

EFFICIENCY: SMART HABITAT

Investing in an **efficient home** allows consumers to **enjoy good quality time in a comfortable and sustainable environment**. A technology-enabled home is **not about speeding up** life but about **helping people free up time** to do the things they really enjoy. **The EMPATHIC home is a place to reconnect and relax.**

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“HOME IS NOT WHERE YOU LIVE, BUT
WHERE THEY UNDERSTAND YOU.”

Christian Morgenstern



NEW DEFINITION

2010: Our home is a place of retreat from the pace of the outside world. It is **connected, interactive** and **inclusive**, allowing us to feel smarter, more efficient and empowered as human beings. Smart devices and apps monitor consumption of energy, water and food instantly, enabling us to be more in tune with our environment.

2010+: The SMART HABITAT moves **beyond simply measuring** consumption towards **self-adjustment** in order to meet the needs of the inhabitants and deliver the most efficient solutions. Intelligent homes **anticipate people's moods** in a highly responsive environment. **Technology allows us to synchronise our activities** and our lives, and to align them with others. This places us in control, allowing us to play with time and make it work in our favour. We can **reconnect** with each other, with our **passions** and with **ourselves**. Home is where we recharge and relax, so we need it to offer security, as well as delineate our privacy – it is the **last truly private place** in our hyperconnected society.

A growing emphasis on 'slow living' is a response to our hyperconnected lifestyle – we need to allow ourselves to **dwell on a single task and enjoy processes rather than end results**, whether it is cooking or playing or other favourite pursuits. The present becomes the focal point in a world that is dominated by parallel continuous activities. As technologies mature, the EMPATHIC and sensorial qualities of the home become ever more sophisticated. The SMART HABITAT is not conceived to become obsolete, or designed for short-lived gratification. It is an **investment** in our future selves and an **emotional commitment**.

TECHNOLOGY + PRIVACY + SLOW = SMART HABITAT

“We can reconnect with each other, with our passions and ourselves.”



INSPIRATIONAL SOURCES

John Maeda: How do we slow down what matters the most and speed up what benefits change?

Alexander Rose: Slow movement and long-term thinking versus similar - deal with an ignored space - people too obsessed with all things fast and immediate.

‘Everyone should receive a Montblanc pen and a Rolex watch at birth, and then they’d never need to replace them in a lifetime.’ **Saul Griffith, Inventor**

Dieter Ram’s principles for Good Design:

Good design is innovative.

Good design is aesthetic.

Good design is unobtrusive.

Good design is honest.

Good design is long-lasting.

Good design is thorough down to the last detail.

Good design is environmentally friendly.

Good design is as little design as possible.

“Good design is honest.”

1

2

1 & 2 *The Hearth House* by AOC. Photography: David Grandorge



FACTS, FIGURES & INSIGHTS

- **Customised Modular Housing:** Eco modular housing units that are customised according to a family's needs, interact easily with the ecological and physical landscape. <http://enovoca.ca>
- **Self-Construction:** Homeowners choosing to adapt solar energy for their homes <http://1bog.org/>
- **Leisure Time at Home:** By 2012, the average consumer leisure time per day in the UK is expected to be 5.6hrs. The average in Europe, 5.7hrs; the average in the US, 5.3hrs. *Business Insights Limited, The Future of Digital Home Entertainment April, 2010*
- **'Essential Technology':** According to a small poll conducted by the Future Lab, 36% of respondents – the largest group – say that the flatscreen TV is the number one 'essential technology' to have in the home, especially among high earners. *Consumer Attitudes Audit 2010 report by Future Poll in LS:N*
- **The Slow Movement** is a catalyst for rules that support greater reflection and consideration. 'Slow movement allows for flexibility and it is 'more resilient than the system that assumes that nothing ever fails. Just-in-time manufacturing is really great when all component systems work perfectly, but when a part breaks down the whole operation comes to a complete halt. Failure happens. So we'd better build in a way to absorb it.' *Jamais Cascio*
- **The Slow Food Manifesto** was released in a Paris Theatre by the Piedmontese gourmet Carlo Petrini on 10 December 1989. The Slow Food movement consists of more than 100,000 members in over 132 countries worldwide. *Peter Popham, The Independent, 10th December, 2009*



MICRO TREND: SYNCHRONICITY

The home is a multi-purpose space we can adapt for work, rest and leisure. It is the place where we can escape the outside world through gaming and entertainment experiences, or connect with friends or colleagues across vast time zones and plug ourselves into real-time changes in the world. **At home we are in control:** the hyperconnectivity that may exist around us only enters when we permit it; we allow it into our homes on our own terms.

SYNCHRONICITY enables parallel activities to happen at once, uninterrupted – we can synchronise tasks and interactions with those of others and with our habitat to create greater efficiency. And as computing power gets ever faster and stronger, **systems begin to learn from us and anticipate our behaviours and needs.** Eventually we can be completely bypassed when trivial tasks require attention. Learning behavioral patterns can also help systems and services predict when there is a potential breach of privacy. **SYNCHRONICITY** will be seen in relation to the different parts of the home, and between the home and its inhabitants (and even between the internal network and outside networks).

Technology-enabled SYNCHRONICITY also applies to the physical environment itself. With growing urbanisation, many living spaces are becoming smaller, which means they need to work even harder. In this context, efficiency is measured by how well the habitat can accommodate the many and diverse demands we put upon it.

We begin to see technology becoming more carefully embedded within the home. Seamless integration will allow fluid exchanges and interactions. Technology itself will **dematerialise and become invisible**, as it merges with furniture, soft furnishings and even wallpaper – meaning the house of the future is less ‘sci-fi’ and more **homely**.

“Technology itself will dematerialise and become invisible.”

1

2

1 & 2 Gary's apartment. EDGE Design Institute Ltd.9



MICRO TREND SYNCHRONICITY: FACTS, FIGURES & INSIGHTS

- **Blending of work and leisure time:** While contracted daily working hours are showing a decline, the working day will often be lengthened by extra work that can be done after leaving the office. This means that we will spend more 'active time' at home. *Business Insights Limited, The Future of Digital Home Entertainment, April, 2010*
- **Robotics:** Recent innovations mean demand for robots is broader as use of robots for cleaning is becoming more accepted. Products are now more diverse, with technical improvements in sensors and visualization. Also robots are becoming less expensive and more adaptive to the cleaning task. *Research and Markets: Cleaning Robots Market Shares, Strategies, and Forecasts, Worldwide, 2010 to 2016, May, 2010, researchandmarkets.com - <http://tinyurl.com/2agownj>*
- **New challenge for technology:** 'Technology brands need to find their place again in the home' *Edward Barber, co-founder of design agency BarberOsgerby*
- **Broadband:** The first country in the world to make broadband a legal right for every citizen is Finland (from July 1st 2010). It is believed up to 96% of the population are already online and that only about 4,000 homes still need connecting to comply with the law. In the UK, internet penetration stands at 73%. *Finland makes broadband a 'legal right', 1st July, 2010, www.bbc.co.uk - <http://tinyurl.com/2c96yv5>*
- **Networked nation:** By 2010, Martha Lane Fox, the government's digital champion, aims to make Britain the world's most networked nation by getting the whole nation online. Race Online 2012 is a business-to-business campaign to encourage partner organisations to commit their resources to helping get people online. *My Bright Idea: The Observer, 18th July, 2010*



MICRO TREND: EMPATHIC HOME

The living habitat of the future will be responsive to sensorial and emotional, as well as to pragmatic, needs. In other words, the smart home of the future will become EMPATHIC.

Living highly fragmented, hyperconnected lifestyles has somewhat disconnected us from the physical world and from uninterrupted linear processes. To counteract the effects of our fast lives, more people gain enrichment from **slowing down at home, reconnecting with each other and the environment**. The smart home of tomorrow will facilitate our lives by mimicking biological systems and helping us **re-wire our senses**, enhance personal well-being and reinforce a sense of process that is highly fulfilling.

In this context, home luxury is redefined, though still characterised by scarcity – or by whatever society has a hard time acquiring. In a hyperconnected society two things are increasingly scarce: **time** and **privacy**. This means that services or products that can help us regain time or afford us privacy become highly desirable.

The home is becoming the last truly private domain and the only place where we can allow our personalities and emotions to emerge. Privacy therefore remains a priority when investing in our homes, especially as our habitat becomes enabled to harvest information about us that we are not even aware of. We need to **TRUST** our home environment to **protect us**, both physically and emotionally, and to represent a clear expression of our character.

In short, living at both fast and slow speeds, we need technology that facilitates the switch between hyperconnectedness and a sensorial, slow and ‘unplugged’ mode.

*“We need to **TRUST** our home to protect us, both physically and emotionally.”*



MICRO TREND EMPATHIC HOME: FACTS, FIGURES & INSIGHTS

- **The Emotional Home:** We are witnessing the return of a 'fewer and better' attitude to consumption in the spheres of fashion, food and home. *Report by LSNglobal.com*
- **Home Sense Project:** Homeowners and tenants are given the software and hardware to ensure their smart homes are suitably adapted. <http://www.homsenseproject.com>
- **Identifying complex activities with mobile phones:** Japanese interaction design teams with KDDI research and development laboratory have developed software to recognise complex movements. *PSFK, 9th March, 2010*
- **Smart living:** Nokia Bots perform tasks for you by learning your behaviour, e.g. setting alarm *Maz Reyner, 19th April, 2010.*
- **Eco-Home Trends 2010:** The trend towards greener, more sustainable building underlies many design choices of today's buyers. There is a strong connection between houses, energy use and sustainability. *Roselind Hejl, Eco-Home Trends for 2010, 9th January, 2010, technorati.com - http://tinyurl.com/y95rm6x*
- **Residential energy:** The use of residential energy will increase by an average of 1.1% a year between 2007 and 2035. The largest increase will come from electricity, rising an average of 2.2% per year. *Business Insights Limited, The Future of Energy Efficiency August, 2010*





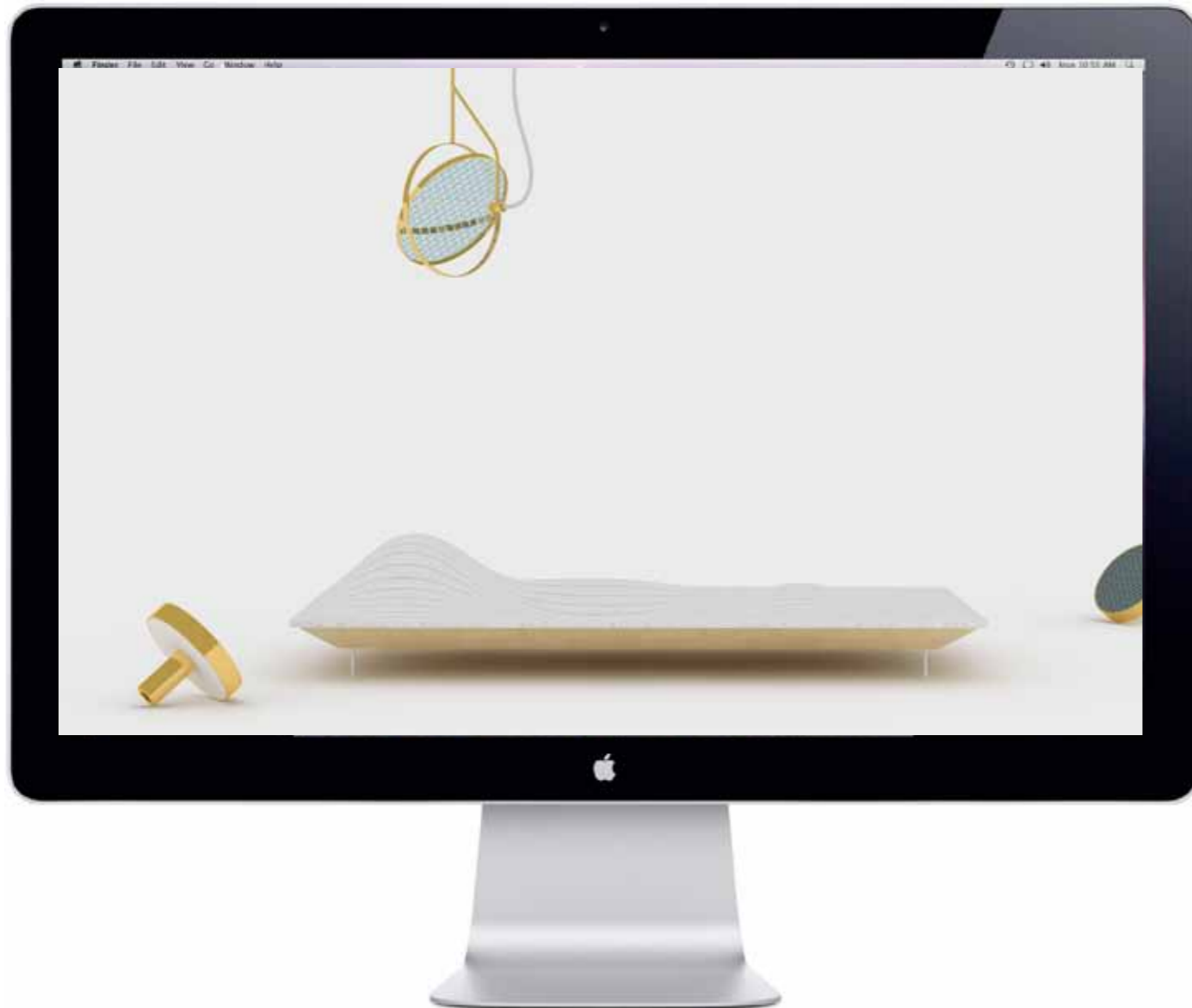
CASE STUDY

HOME IN THE PYRENEES

Home in the Pyrenees: an efficient, contemporary home well integrated into the local context. Enables fluid interactions and allows diverse needs to be met.

dezeen.com

<http://tinyurl.com/36eudpj>



CASE STUDY PHILIPS DESIGN

Philips Design Metamorphosis: Enhances our personal well-being by reconnecting us with the natural environment.

design.philips.com

<http://tinyurl.com/2w4vuxb>



IMPLICATIONS

Enabling people to turn their homes into what they want them to be: a smart and intimate place.

There is a clear dichotomy between the hyperconnected, ALWAYS ON lifestyle people are happy to lead when on the go and the need for privacy and slowing down they manifest in their homes. Indeed, thanks to the intense multitasking allowed by our mobile devices when we are outside the home, we are able to lead our lives at a different, slower pace when in the home.

The home is the last private place, where people have a **heightened sense of intimacy and security**. This opens up opportunities for O2 in terms of providing security solutions to protect not only people's personal lives but increasingly their professional lives too, as boundaries between work and play blur, and more office work is carried home.

The home is also a reflection of who we are as individuals. Learning from our behaviours, the home becomes smarter with intelligent technologies that self-adjust to the needs of the inhabitants.

Our **home segmentation** is a powerful tool to understand the different types of inhabitants, their technological and emotional needs. It provides us with invaluable insights about what matters to different consumers in their homes. It helps us identify opportunities to differentiate ourselves in the home marketplace by providing **tailored home packages** whereby people pay for what they actually need and want to consume. This fits with our strategy to be a FRESH, BOLD, OPEN and HELPFUL brand.

Additionally, as people have a stronger sense of legacy, they want to be able to transform their homes to fit their desire to **lead green and leaner lifestyles**. This will be increased by government regulations that impose monitoring of energy consumption with smart meters on home-owners.

In the future, the home will be integrated to all the tasks people want to perform. The mobile device will be the remote control of home technology so that people can feel secured in their SMART HABITAT. For O2, this is a sizeable opportunity - to be the **first mobile operator to truly bridge 'out of home' and 'in home' services through a seamless experience**.



SUGGESTED ACTION POINTS

THE INTEGRATED HOME

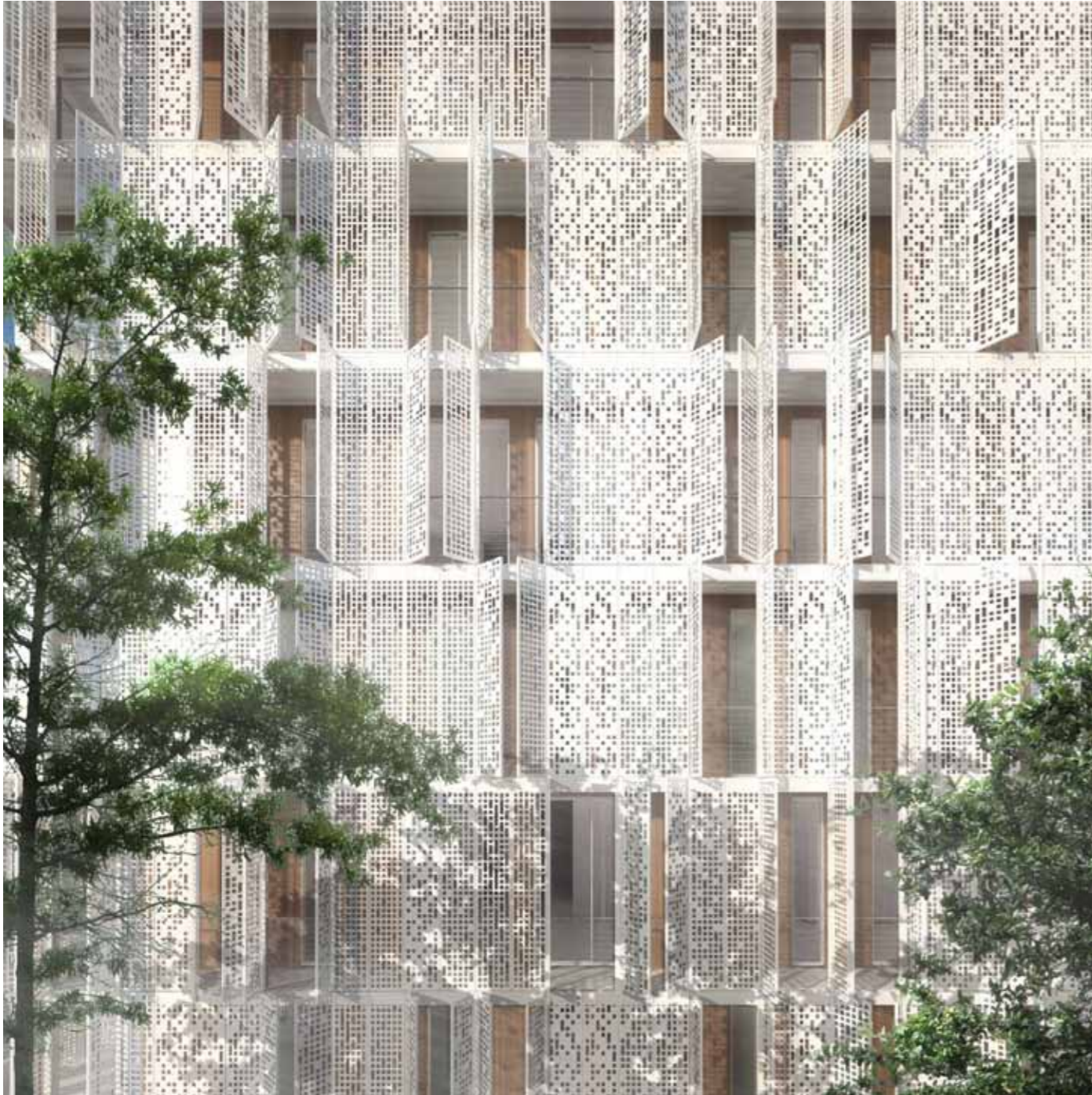
The home is not dissociated from the 'out of home' anymore. People are increasingly social, thanks to technology. We put more demand on the home: we play more, we do more.

- Faster broadband:** as people are becoming increasingly social and want to share their experiences, transferring documents, video or pictures files relies on a fast upload speed. Internet take-up has now reached 73% in the UK, the majority of which is fixed broadband (Ofcom report, August, 2010). However, for consumers to download content or services stored at home while they are out, they need fast upload speed at home. But ISPs offer slow upload speed, typically just 500Kbps to 1Mbps in Europe, which is about a tenth of the download speeds that consumers enjoy (Forrester Research, Consumers Need Cloud-Based Products Now, 2010).
- Connected TV:** Television still dominates people's media habits, with the average UK person spending around 3.8 hours watching television every day (Ofcom report, August, 2010). The share of European online consumers who exclusively watch TV on a TV is decreasing. In 2009, only 63% of European Internet users watch TV only on a TV, down from 80% in 2007 (Forrester Research, The European Three-Screen Audience is growing, But TV still reigns, April, 2010). Additionally, if TV is still the primary media channel, people are moving from passive to active participation with the medium. Especially for younger consumers, watching TV is often mixed with other activities. Of 45% of teens who watch TV while also online, 47% like to talk with their friends online via email or instant messaging about what they are watching on TV, compared with 28% for older users (Forrester Research, How European Teens Consume Media, 2009). This is a great opportunity for O2 Media to encourage realtime dialogue with teen viewers while content is broadcast. Connected TV sets with embedded Yahoo! TV Widgets, Google TV or Canvas allow interactivity to satisfy people's appetite to share experiences. The Connected TV solutions that will succeed are the ones that offer consumers access to their familiar apps, media and communication services. There is no need for O2 to create new apps, but rather to enable consumers to connect to their favourite content and platforms in a seamless manner. Understanding our home segmentation will ensure we provide the relevant connected TV packages.



THE INTEGRATED HOME continued

- Integration to portable/mobile devices:** Currently there is very little integration between mobile and the home. Most products that synchronize files across home computers utilize the extremely high speeds of home networks that are significantly faster than any mobile network. Unlike with a cloud service, consumers must think ahead. Consumers must have both computers switched on and connected to the home network to transfer content before they carry their laptop out of the home. Remote login solutions assume low connection latency. Products such as LogMeIn, GoToMyPC and Apple's screen sharing assume that the user's Internet connection is very responsive, with little lag between pressing a button and the response being communicated to the remote users home PC. Mobile networks have a much less responsive connection than home broadband - latencies are more than 100ms and often more than 300ms, compared with less than 10ms for a home network or an ADSL home broadband line. (Forrester Research, Consumers Need Cloud-Based Products Now, 2010). **O2 has a clear opportunity to offer "always best connected" services** in any particular usage situation. Such services would combine mobile macro network connectivity with options to access (public, or private) wi-fi networks where advantageous, or potentially other in-home connectivity solutions such as femtocells, ZigBee or power line.
- Entertainment services:** As leisure time in the home increases, some consumers will demand seamless entertainment experiences. Sonos (www.sonos.com) offer multi-room music systems, supported by a wireless mesh network termed SonosNet controllable from any desktop, laptop computer, iPhone or iPod touch. Music can either be streamed from radio stations over the internet, served from music files saved on a local computer or streamed in from services such as last.fm. Individual music players (ZonePlayers) also function as wireless network repeaters. Music can be served simultaneously to different rooms, or different players in the same room, or different songs can be played on different ZonePlayers simultaneously. Similar services are offered by Logitech with their Squeezebox (www.logitech.com/en-gb/speakers_audio/wireless_music_systems) device family, Olive (www.olive.us) servers and players, and Linn (www.linn.co.uk/multi-room_ds) offer an audiophile equivalent. Given O2's heritage in music, these entertainment services appear relevant to secure our place in the SMART HABITAT. In addition to this, the increased use of tablets should be on our radar to ensure we provide portable entertainment solutions for our customers.
- Tailored packages:** It is clear that demand on the home will vary depending on the type of household. Our home segmentation helps us identify the services that we should market to the different household types, to ensure that we answer people's increasing demands on the home depending on their lifestyle. As the UK is leading in terms of flexible home working, it is likely that some households will require higher broadband speed than others. In addition to this, as leisure time spent at home is increasing, European online adults are increasingly watching TV content on demand, Pay-per-view, VOD and catch up TV as viewing grew by 22% between 2008 and 2009. This is set to grow, as 25% of European online 16-24 year olds use those services on a weekly basis. If the youngest generations retain their current habits, on-demand TV and video will become an integral part of European consumption in the medium term and service providers will be able to charge for this content, providing it is meaningful or entertaining to consumers (Forrester Research, The European Three-Screen Audience is growing, But TV still reigns, April 2010). Therefore it is crucial for O2 to play in this space to aggregate great content and services. Social media tools and discovery tools will be vital to success. In this spirit, partnering with content providers to provide hybrid platforms will enable us to capture a higher share of the TV audience. As a Telco provider, we have the opportunity to provide our consumers with a tailored, convenient and integrated experience at home and on the go.



THE SECURE HOME

As the home is the last private place, consumers are increasingly concerned with security issues. They want to make sure their home is safe.

Security services: Security in the future 'Internet of Things' will be complex. Clearly IoT-related infrastructure will need to support sophisticated access controls and rights so that data security is maintained. New IoT devices that are purchased by consumers will need to be integrated into their own personal IoT constellation, in an efficient and secure way that ensures that any sensitive information is not made available to unauthorised third parties. Processes and procedures must also be in place to preclude the fraudulent registration of consumer devices into IoT constellations, run by people with dishonest intent, in the event that the owners of such devices do not themselves wish to register the devices.

Home security systems incorporating IP-TV monitoring are already offered by Alertme. Other initiatives include The ZigBee Alliance (www.zigbee.org), an association of companies working together to enable reliable, cost-effective, low-power, wirelessly networked, monitoring and control products based on an open global standard. The Alliance intends that ZigBee technology will be embedded in a wide range of products and applications across consumer, commercial, industrial and government markets worldwide. As consumers become increasingly protective of their home, considering such services would help position O2 as a trusted and helpful partner within the home.

Support services: As the home is becoming increasingly connected and consumers demand more technology, we have the opportunity to provide support services. These could include identifying consumers' needs (security, broadband, fixed line, smart metering, etc) and setting up all those services for consumers in their homes. This would help differentiate O2 from other providers and would enable us to position ourselves as the brand that provides 'always best connected' services. It would also provide us with additional information on our customers for our CRM programmes and enable us to offer more cross selling.



THE GREEN HOME

Given the choice, people will choose green energy because it is good for the environment and cost efficient. A recent study by Columbia University showed that on average people underestimate both energy use and energy savings by a factor of 2.8, mostly because they undervalued the requirements of large machines like heaters and clothes dryers. As a result they failed to recognize the huge energy savings that can come from improving the efficiency of such appliances (Proceedings of the National Academy of Sciences, August 2010). With our strategy CELEBRATING HELPING we can position ourselves as the service provider that can help **educate consumers about their energy consumption to save energy.**

- Smart Meters:** REGULATION is driving smart meter adoption across Europe, with Germany, Sweden and France pushing the installation of smart meters. Google is also tapping into this trend with the Google PowerMeter, a free energy-monitoring tool that claims to help users to save energy and money. Using energy information provided by utility smart meters and energy-monitoring devices, Google PowerMeter enables users to view their home's energy consumption from anywhere online. AlertMe Heating enables heating to be controlled via text message or online. AlertMe claim that only heating a home when it is necessary can save up to 20% on energy bills by not wastefully heating a home when it is unoccupied. As a service company with a strong CSR agenda, providing smart metering solutions for our consumers seems relevant. It will help us position ourselves as a trusted and helpful partner. By 2015, the UK government will enforce that every household and business should be equipped with a smart meter. This is a very important aspect of the REGULATION micro trend, which opens up a lot of opportunities for O2. Many trials have been conducted to enable users to view home energy consumption on their mobile phones. Such trials have considered consumption for individual electrical devices, as well as for the whole house, and to see whether the devices in the homes are on or off, and also if more energy is being used than in the past. The opportunity for O2 is to come up with a user-friendly software, as so far none of the current players seem to have found the ideal way to display this information. Such service enables consumers to live a more sustainable lifestyle and to save money. Rather than waiting half a year for the energy bill, users can see precisely where the energy is being used, and ultimately decide whether this energy use is really necessary. Researchers estimate that home-owners will be able to reduce their energy costs by 15%.
- Green Energy:** In order to own the 'end-to-end' home experience and truly take a stand for sustainability, O2 could invest in green energy and become a utility provider. This would firstly help reduce O2's energy consumption (O2 currently uses 0.1% of the UK's total energy consumption). Secondly, it will help provide consumers with green energy alternatives from a brand they trust.

NOTES

A series of horizontal dotted lines for writing notes.