Monitor
Deloitte.

The Insurer's playbook on Smart Home

Point of View

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Current situation

The state of the Smart Home OEM market & stakeholder involvement

The global Smart Home market has been estimated at around $20 billion and is expected to almost triple in size by 2020[1]. There are two main components to Smart Home products: the smart appliance itself and the software that controls it.

The main categories of Smart Home appliances are as follows:

- Energy management systems (e.g. smart devices and light control)
- Heating, ventilation, water and air conditioning control
- Intelligent/ learning household aids and maintenance control
- Entertainment
- Security and access control (surveillance, motion sensors, intrusion)
- Safety monitoring (fire, gas, etc.) and emergency systems
- Home care support
- Infrastructure management

The industry revolves around four categories of stakeholders. Insurers need to closely monitor their interconnections and relationships to understand how to properly act in the ecosystem:

- Appliance / Device Manufacturers build the infrastructure of the Smart Home (in the categories described above): they are autonomous in deciding communication standards and protocols that govern all interactions within the Smart Home
- Service Providers supply a range of services based on the information that smart devices and appliances collect, from simple monitoring of one aspect (energy, security, leaks) to integrated solutions all guided by sensor data. These providers include B2C services with completely new concepts, such as podshare.com or assisted living facility monitoring and management
- Hub Providers mainly focus on offering solutions (hardware and/or software) that are able to overcome the difference in communication standards between device manufacturers (see focus below). Standardization providers, such as Zigbee, relayr, IEEE[2] or IETF[3] belong in this category as well
- Consumers, in their choice of providers for appliances, services and hubs, are often concerned not only with technical performance, but also (or especially) with data management practices, which are generally included in the suppliers' service agreements

Smart Homes are currently making their way to the mainstream – the technology is ready for widespread adoption

[1] Marketsandmarkets.com
[2] IEEE: Institute of Electrical and Electronics Engineers
[3] IETF: The Internet Engineering Task Force

Although most of the early movers into the Smart Home business area concentrated on the development of protocols and industry standards, some issues remain pending, e.g. the lack of Smart Home business services from appliance producers and the lack of communication standards across devices. For this reason, tech giants who have more recently joined the market are concentrating on compatibility and looking to establish standards by focusing on hub solutions that embrace both hardware and software.
Notable examples of players in Smart Home appliance and software:

- With SmartThings, Samsung has launched a device that works as a hub for a large number of Smart Home appliances. Coupled with a wide compatibility range, one of the main strengths of SmartThings is the community of "home hackers" who are constantly sharing tricks and workarounds for all devices that are not directly compatible with the system
- Amazon's Echo is an intelligent speaker that can interact with connected home devices: it has lately become the centre of attention for its ability to receive, what are known as, "far-field voice" commands, i.e. not standing directly next to the device when speaking. Device producers are increasingly designing Echo-compatible products (e.g. security players Vivint and Alarm.com) and Amazon itself has developed an API (Alexa Connected Home Skills) that will be directly compatible with more and more device categories over time (e.g. smart lights and thermostats)
- With the NEST acquisition of 2014, Google has entered the market, but even though the former start-up is still well active on the market, the recent launch of Brillo and Weave (an operating system and a cross-platform language) has shown a shift in focus from hardware to software. Further developments are expected, as the first devices working with this Google software launched in early 2016
- Early movers like RWE, Philips, or Honeywell are still strong in the market, and they too are working on compatibility: for example, the start-up Wink produces a hub system that is compatible with some of the largest Smart Home appliance producers, such as Philips, General Electric, and Honeywell

Some suggest that the Smart Home market is currently facing some tough challenges on its way to the mainstream. Some of the examples above - along with many other instances of large companies taking action in the industry, such as Apple, Honeywell and others - suggest that the market is indeed evolving and the technology is ready to move to widespread adoption.

Smart Homes and insurers

The evolution of Smart Home technology will have significant implications for insurance providers, who will benefit from the enhanced features and abilities of smart appliances / devices by being able to offer risk engineering insights to customers, advanced risk selection, sophisticated and incentive-driven pricing, early (even predictive) loss detection and prevention, and additional home-centred services.
The most significant change for the majority of smart appliances and devices will be the evolution from simply being able to receive remote commands as we do today to much more evolved features in the future, which are likely to include the ability to directly react to external stimuli and take the appropriate preventive actions.

Examples:

- Today, a washing machine is generally able to detect leaks and stop before too much harm is done. In the near future, we expect appliances to be able to detect changes in performance and suggest (and maybe arrange with technicians) the maintenance required

- Energy management systems are currently able to regulate and optimize consumption. Tomorrow's systems will learn from our habits and from external conditions (e.g. weather, temperature, etc.) and will automatically adjust program maintenance and overall operations without the need for human intervention

The potential implication for home insurance is huge, as Smart Homes are expected to reduce harmful events. Consumers expect insurers to take into account the evolution of risks and ultimately lower their premiums. Some insurers have already introduced initiatives related to Smart Homes.

First movers for such practices date back to 2013, but recently several players took concrete steps in partnering with Smart Home appliance manufacturers:

- Both American Family Insurance and Liberty Mutual are offering discounts for owners of Nest Protect smoke detectors

- State Farm customers can benefit from discounts on products from ADTPulse and Canary (OEM specialized on security) and on insurance products

- American Family Insurance has also partnered with Ring (smart doorbell producer) to decrease deductibles in case of burglary/theft

- BNP Paribas Cardif Italy combines mobile and telematics to help customers protect their homes through "Homebox" by detecting fire, smoke, flooding, and electricity failure and then alerting both the customer and the operation centre, which immediately activates assistance services

- AXA cooperates with RWE in Germany in offering an integrated product/service bundle of Smart Home technology, control, services, and claims handling. AXA is also aggressively investing in Smart Home solutions in Indonesia and Singapore

- CosmosDirekt provides insurance together with a Devolo Home Control Starter Package (for free), however the offering does not foresee innovations in the actual property policy.

- Allianz Worldwide Partners works with Panasonic in Germany to combine the Smart Home technology of Panasonic with the services of Allianz Global Assistance

A paradigm shift

Some insurance companies are also directly investing in Smart Home appliance producers, and others have actively tested solutions with Smart Homes. American Modern, for example, has built a complete replica of a Smart Home to better understand the impact of the technology on risks. Munich Re and HSB HARTFORD STEAM BOILER have invested in relayr to build a Smart home ecosystem.

The evolution of technology will require a paradigm shift in insurance offerings: from the current focus on covering losses to preventive maintenance and loss minimization or downright prevention. In the end, we expect to see services step into the spotlight and leave the classic insurance products behind, moving insurers towards managing events as well as processes for customers. There are many touchpoints in the home ecosystem that offer interaction. For most families and individuals, the home acts as the nucleus of their lifestyle. As a result, the home itself reflects the needs, desires and behaviours of individuals, opening the door for innovative solutions that go beyond current insurer offerings.

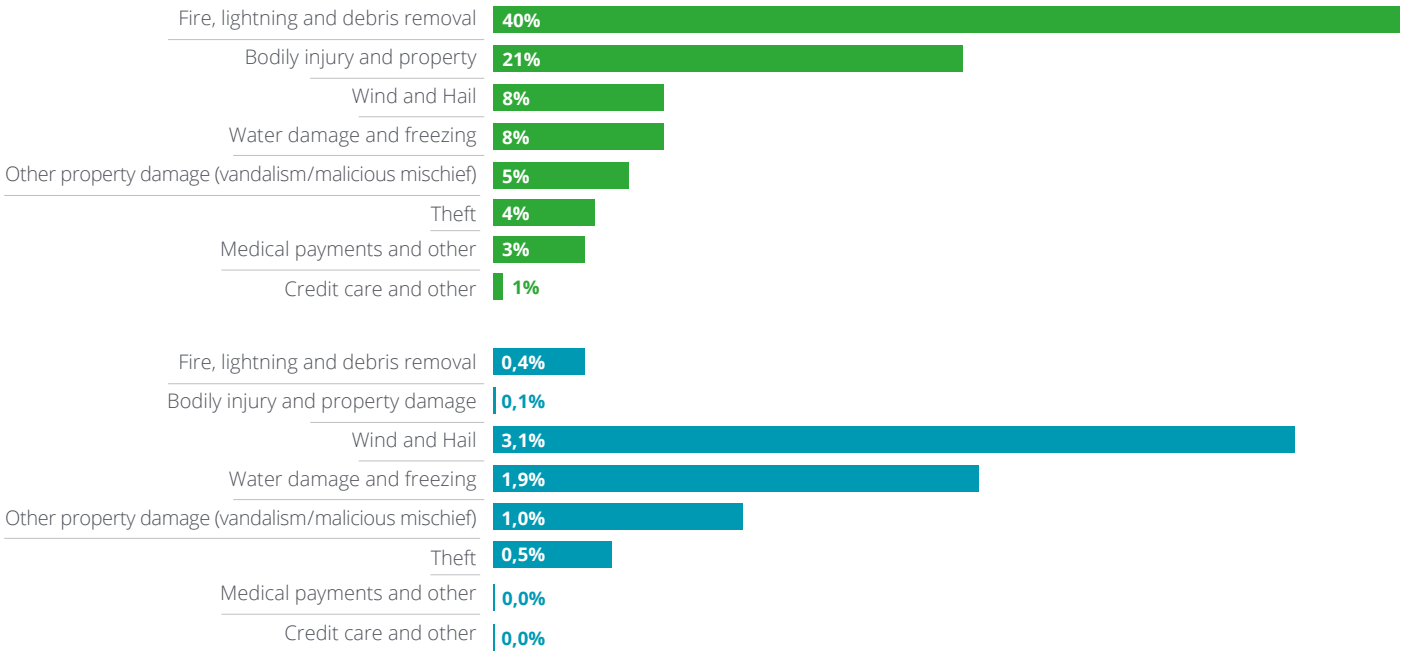
"The Home" ecosystem

Home insurance today

Home property insurance today typically covers damage to the home caused by natural disaster, robbery and theft, vandalism, and thunderstorm-related electrical issues. Additional coverage is for fire and flooding/leakage damage and damage stemming from wantonly negligent behaviour. Some insurers are already offering bundled products that include bikes, cyber risks, travel insurance and multiple other packages[4].
However, these products are bundled in advance and do not offer customers personalized or modular packages. Underwriting is still done by old-fashioned risk assessment data, such as the area code the inhabitant lives in, size of the apartment and living situation.
At present, behavioural aspects are not really taken into account beyond claims data, which currently resides in legacy systems.

The table below indicates the severity of the average claim per group fire and lightning are the most expensive per claim section. The highest incident and thus claims rate is however shown by wind and hail, with 3.1 incidents occurring for every 100 years of house policies held. This means that while the biggest financial payout effect per event occurs with events such as fires, the most bureaucratic effort is likely to be created by other event types[5].

Abb. 1 – Severity of the average claim per group



[4] Allianz, AXA, Asstel, HDI Gerling, Monitor Deloitte Analysis
[5] Insurance information institute, Monitor Deloitte Analysis

The Smart Home's ecosystem

Many of a person's activities and needs revolve around his or her home; the home has touchpoints with many aspects of personal life from health to property, from mobility to financial and personal security. Moreover, the Internet of Things revolution is most likely to centre on the home, which will increase its importance in a person's life and make it the "control centre" for most daily activities.

Starting from the above-mentioned touchpoints and the technological breakthroughs we can expect, behavioural analysis will become a vital factor. Insurers need to leverage this information to improve the way they serve customers and shape their offerings in the future. Examining at-home behaviour will be a good information source that is also transferable to other areas. For example: mobility habits usually start and end at home (car), a physical ailment may force someone to stay at home (health), eating and exercising habits generally take place in or around the house (life & health), mortgages and other financial products are often linked to a person's home (finance).

If all devices, appliances, and tools in a person's life are connected to each other, they are able to communicate, collectively learn from observed habits and provide a response based on external conditions. The home will know where the car is parked and will alert the owner if something harmful might be happening nearby (accident, fire, hailstorm); the home will analyse air, water, sleep patterns and suggest changes in nutrition or behavioural habits to promote better health. Home appliances will communicate directly with users and suggest ways to optimize the use of resources (energy, food waste, etc.).

If such behavioural data is included in credit scoring and premium calculations, positive habits can be rewarded with concrete monetary savings: financial customization and optimization will be increasingly accurate. The ultimate objective of collecting and processing data quickly and thoroughly is not only to improve customer profiling, but also to actually reduce risks exposure by suggesting behavioural changes, preventing harmful events or foreseeing wrong behaviour and technical defects. The services provided will be strongly focused on prevention long before "things" happen.

Mature and immature markets

In order to create a focused and targeted offering for insurers in the home telematics segment in the future, we need to classify markets according to their given maturity. It also seems relevant to classify markets, as consumers from the NAFTA and EU zones will account for only 22% of global consumption in 2030[6].

Immature markets are driven in large part by the growing middle class, which will itself have a strong impact on the economy. Total middle class spending in the Asia Pacific region is expected to grow from US$ 4.9 trillion in 2009 to US$ 32.9 trillion in 2030[7]. The housing and real-estate market is not going to be spared by this development, and we expect home ownership to grow in these countries. Behavioural economic research indicates that losses loom larger than gains, implying that preventing a loss is more important to individuals than gaining more wealth.[8] This will introduce unprecedented risk adversity in the middle classes of emerging markets, opening up opportunities for insurers. The perception of what constitutes a loss depends on a set reference points. If the reference point is "owning a house/ apartment", then people are more likely to buy insurance to avoid losing this quality of life status.

We feel there is a strong probability that this growing middle class is going to technologically leapfrog Western development and directly move into homes with smart functionalities. Thus, insurers need to be ready to offer unconventional and digitalized products that encompass and utilize Smart Home data in order to gain quick access to this market. In certain emerging markets, there could also be public sector demand for aggregated, analysed, and predictive Smart Home data to, for example, foresee pandemic spreads (e.g. sensors in water pipelines). This could motivate governments to incentivize Smart Home initiatives, lower data privacy barriers and also grant access to additional upstream and potential players to enter the micro-insurance market.

Mature markets show a different picture, as they are very saturated in property offerings, and the commoditization of products is quite well-developed. They are driven by empowered consumers with a significantly reduced attention span (~30% drop in the last 15 years[9]) and a strong interest in and demand for convenience products. The real-estate ownership landscape is also tilted by Gen Y users who tend to more widely accept the collaborative (or sharing) economy[10] – a trend that is expected to significantly impact capital-intensive investments such as homes. Furthermore, insurance incumbents will face significant market-entry threats from tech-savvy firms focused on the customer experience, who have more frequent interaction points with customers.
Here, the leap forward is quite relevant to insurers; they would do well to embrace it, as the more classic products become obsolete, the greater the churn will be.

[6+7] The Economist Intelligence Unit, United Nations, Monitor Deloitte Analysis
[8] Tversky & Kahneman "Prospect Theory"
[9] Microsoft, Monitor Deloitte Analysis
[10] Deloitte University press

It is questionable whether hardware providers would be willing to build the extensive service networks insurers have today

Opportunities for insurers

The question that remains to this point, is how the insurer is actually going to access the market, given that hardware providers currently own the customer interaction points.

For mature markets, Deloitte has undertaken extensive research and conducted a Smart Home survey for the German market to better understand what moves customers to buy Smart Home products and implement them in their home. Findings indicate that one of the key barriers is a lack of trust in the data security of the Smart Home applications.

Market leaders could capitalize on their superior brand with a proven track record in keeping highly sensitive data (e.g. medical records) safe for decades. This could overcome the initial hesitation in buying these products, especially among the older generation, who are currently less likely to purchase Smart Home appliances (even though they might benefit from them). One of the most interesting results of the study found that individuals would be willing to pay for additional services, such as security services (23%), a 24-hour service hotline (22%) and installation of the equipment (20%). Today it is questionable whether hardware providers would be capable (and willing) to build up such a service network in order to sufficiently serve these demands. Consequently, market leaders could get a foot in the door by providing these services in cooperation with hardware providers, while simultaneously gathering data from the devices. Financially speaking, the market potential is substantial, as over one-third of respondents said they would be willing to pay more than 20€ per month for a simple bundle including the hardware, alarm system and installation services.[11] Still, to stay relevant, companies will need to make fundamental changes in product design and bundling and stay extremely customer-centric, while accepting alternative streams of revenue besides insurance premiums. Also, a potential reduction in risk exposure due to governed preventive incident and service management can provide a substantial profit contribution. However, a premium downward spiral will follow, given that additional revenue pockets remain untapped.

In immature markets, there is a distinct trend towards new house ownership, due to the growing middle class. As previously mentioned, the insurers strategic options need to evolve from the classic products for property and casualty. If the leapfrogging occurs as predicted, then demand will emerge for homes with Smart Home functionalities in particular. Insurers will need to adapt their offerings and be willing to extend services and products in order to meet the demand. Additionally, we are likely to see different coverage and higher claims than in other markets. Emerging markets should be seen as a long-term investment or ideally as a playground for product innovation, where insurers can develop and pilot more experimental offerings.

[11] Deloitte Smart Home Survey 2015

Outlook and challenges

Overall, it will take some time for insurers to progress, as the maturity levels of home telematics markets will vary in the future:

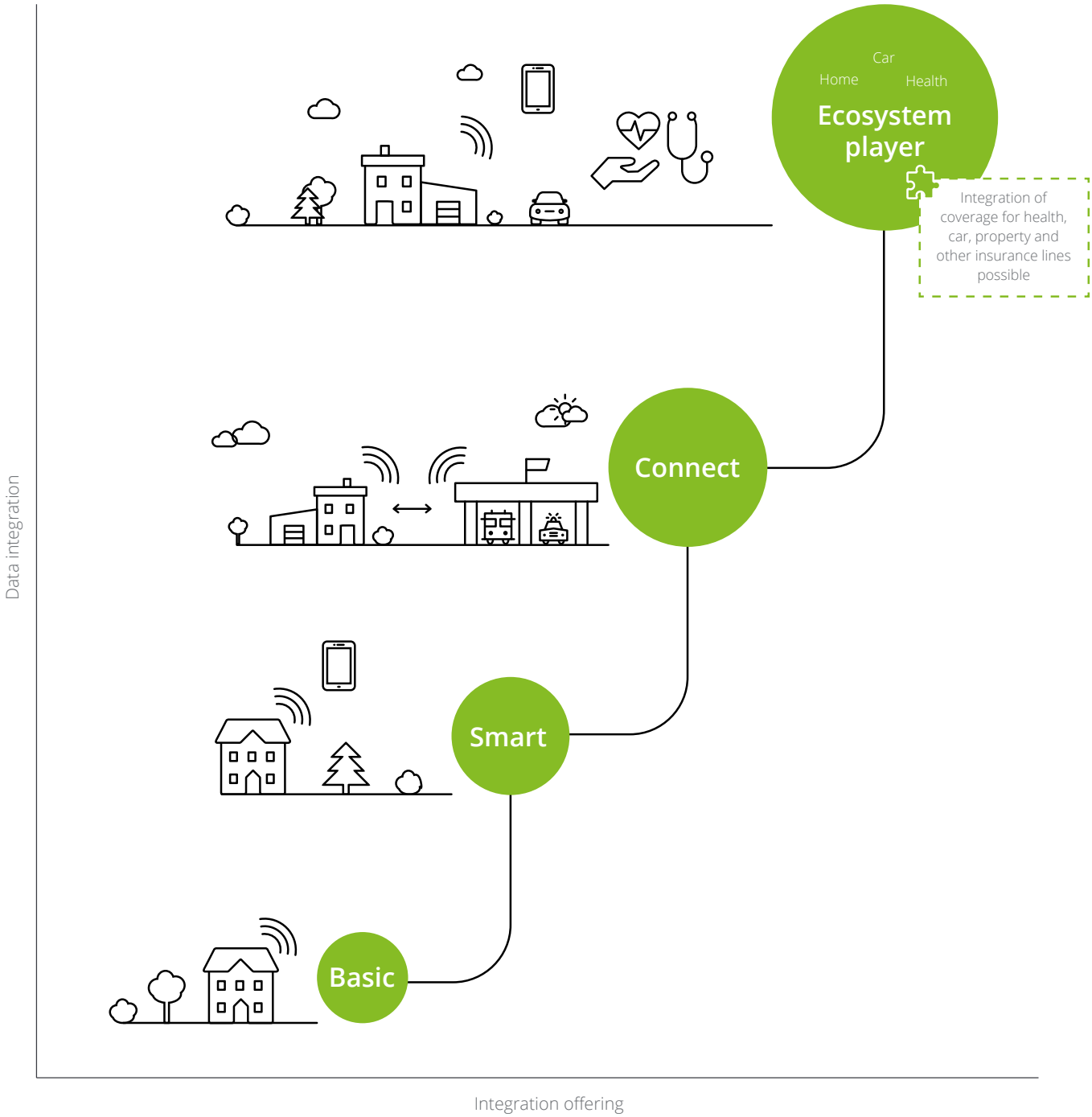
Basic
Basic level maturity is the status for most insurers that are neither utilizing Smart Home data nor incentivizing customers to provide this data. Most insurers are currently at this stage, relying on traditional underwriting statistics and techniques to provide pricing, products, and services.

Smart
The smart maturity level already includes incentives for customers to have smart data devices in their home and campaigns to educate non-users about the immediate benefits of securing or enhancing their homes. Additionally, service or hardware providers with innovative customer access are probably best positioned to identify new leads for more traditional property and casualty insurance products and services.

Connected
Connected insurers for Smart Homes are more advanced, sourcing Smart Home data streams from the hardware provider and utilizing this data to enable enhanced underwriting and pricing. At the same time, this information is already being analysed and used for preventive actions and possibly intervention in order to mitigate risks.

Ecosystem Player
The ecosystem player engages with hardware providers and has a distinct, complementary offering of services and insurance products, which can be marketed together with the partners in order to increase the likelihood of retention and success in new customer acquisition. The ecosystem player would also have adapted their offering in services and products to fully utilize all available data and integrate these insights into every step of decision-making. An ecosystem player is also able to manage – and possibly orchestrate – the interaction of ecosystem incumbents in order to provide the most beneficial service and product experience to their customers. This could include not only partnerships with hardware providers, but also vertical and horizontal integration of service providers to guarantee seamless and convenient experiences for policy holders and prospective customer groups.

Abb. 2 – Smart Home offering and data integration outlook



We need to consider and closely address a number of challenges as the technology matures and before wide-spread adoption is achieved:

Privacy and data usage:
In a world where personal data is increasingly valuable, both insurers and device producers need to assess ownership, disclosure policies, and overall usage practices for the user data they collect. Regulatory evolution is also likely to play a role.

Data security and cyber risk:
As data becomes more valuable, companies will need to step-up in terms of the security of stored data and measures against cyber-attacks. Again, both insurers and manufacturers must be able to guarantee customers adequate data security and access security (worst-case: hackers manipulate home steering devices and cause damage, e.g. by leaking gas, etc.).

Customer education:
Consumers are more than ever aware of the value of their personal data. Insurers will therefore need to effectively communicate the real benefits that subscribers will get by sharing their data, explicitly stating or providing evidence that collecting this data will allow carriers to provide better service and overall higher value.

Technology costs:
New technologies are always costly, even though they tend to decrease in price with time. This trend has already started for IoT devices and, as it continues, it will help insurers communicate to customers the long-term benefits of investing in smart appliances and the relevant savings that come as a result.

Standard-setting:
Where compatibility is an issue, insurers and producers will need to work on improving compatibility at the ecosystem level. As mentioned above, a trend is already in motion with the creation of hubs capable of "speaking many languages". We can expect this process to accelerate as more tech giants enter the market.

Revenue model optimization:
As new technologies go mainstream and premiums look likely to decrease (at least in the medium to long term), insurers will need to be able to diversify their revenue sources. Prevention services and more diverse risk coverage may/could be examples of how to better leverage telematics services and of customer behaviour information.

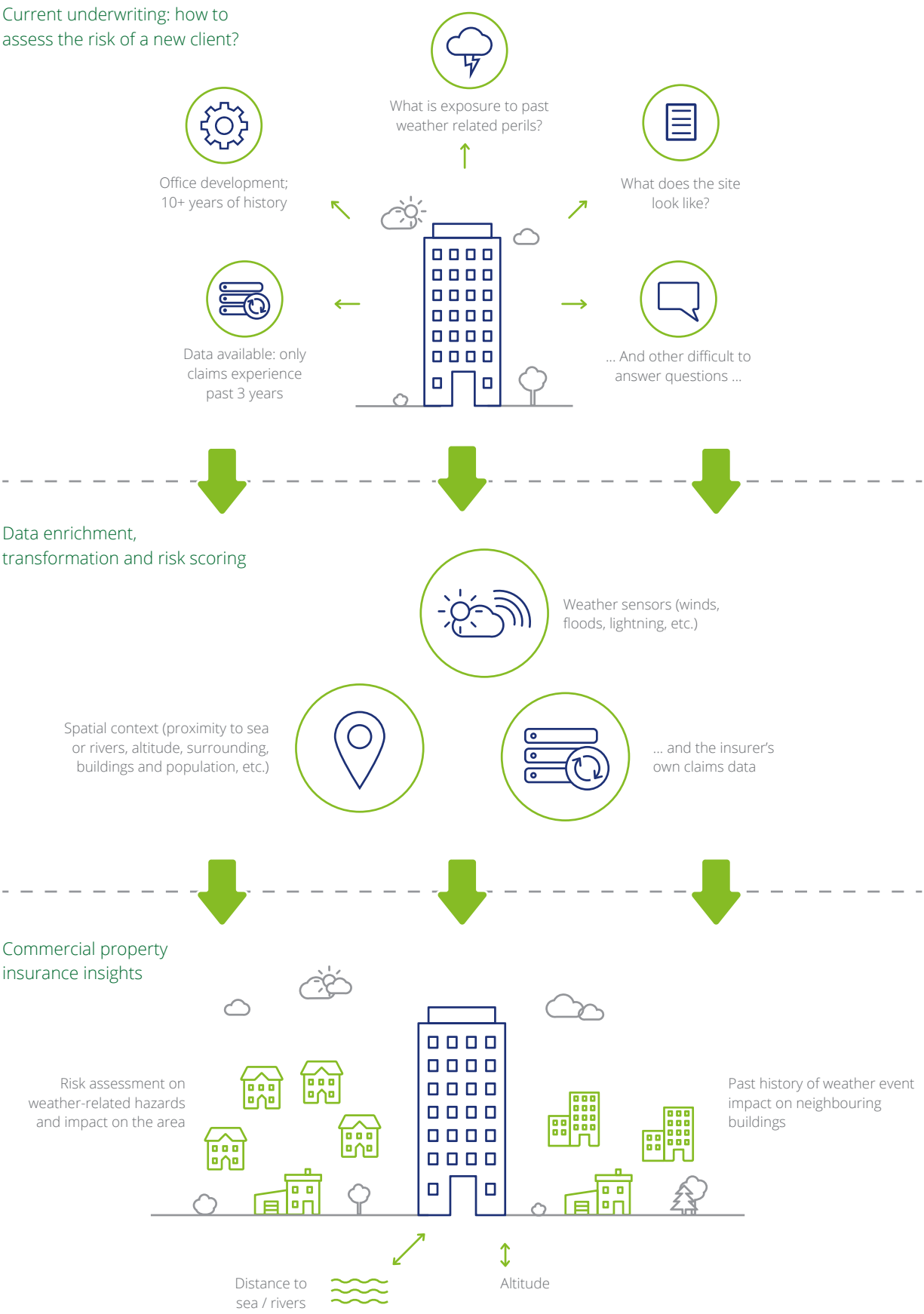
Customer perception:
Many potential customers currently perceive Smart Homes as a solution reserved for "techies" and wealthy people. Companies therefore need to design and promote these products as simple to use and affordable.

Deloitte know-how and selected projects related to Smart Homes

HexScore "Home"

A key Deloitte reference for home telematics is HexScore "Home", a product currently being developed and in use in the United Kingdom. HexScore applies data mining and analytics techniques to provide new insights to insurers via Deloitte's big data platform. The data is aggregated, enhanced with other third party information, such as weather and crime statistics databases, and processed using a sophisticated underwriting algorithm to receive analytical insights on the risk profile of certain buildings. Ultimately, HexScore delivers insights in an effort to generate new products and pricing schemes for insurers active in the property and casualty segment. The infographic below outlines the current process for HexScore's home applications.

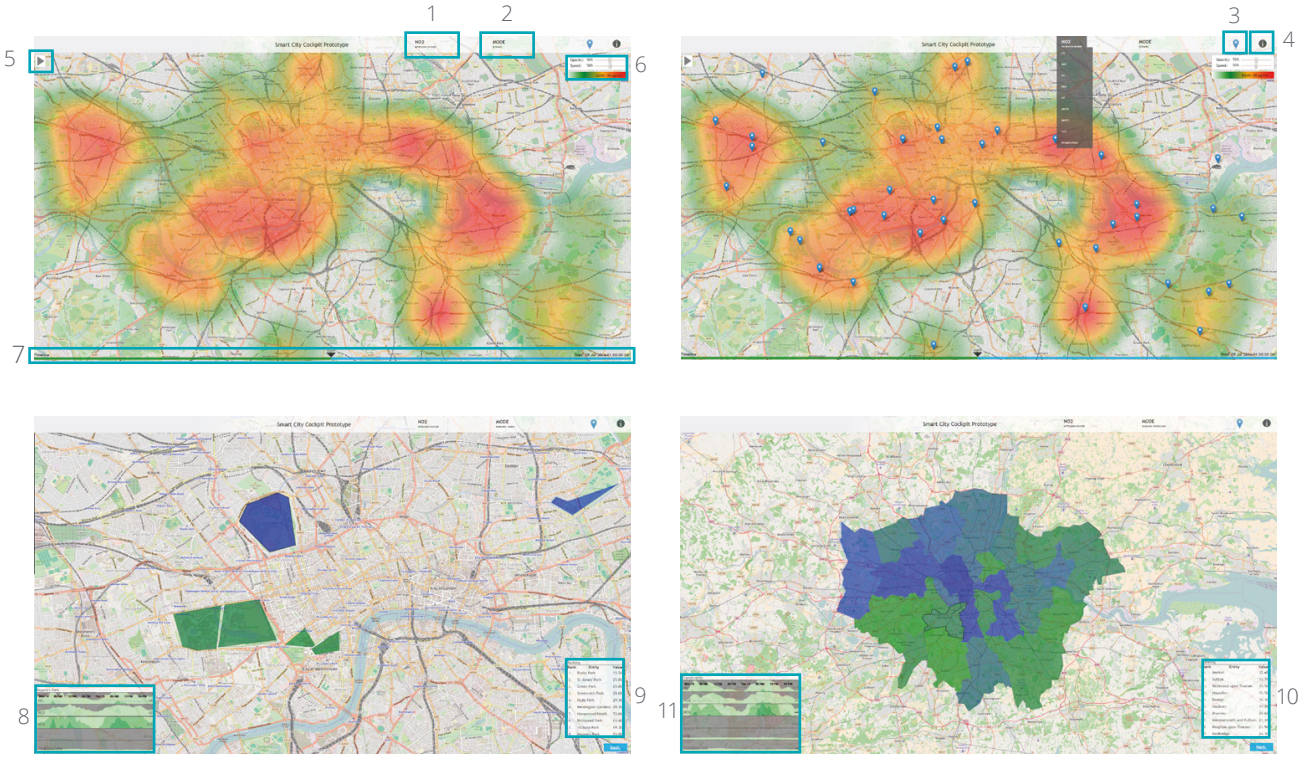
Abb. 3 - HexScore Home Diagram



Predictive air-quality

Additionally, the Deloitte Analytics Institute developed a command centre and information dashboard for the City of London as part of a smart city initiative, which assessed and analysed air quality across the city during certain times of the day.
Within this initiative, Deloitte was able to provide relevant insights using analytics instruments to derive insights on health implications for London's inhabitants.

The system was able to generate recommendations for citizens, e.g. whether it would recommend certain open-air leisure areas based on air quality. This recommendation and analytics process could also be applied in-home air assessment, as is already taking place via companies such as Canary or BNP Paribas Cardif, who have developed a system to collect data on indoor air quality.



Source: Deloitte Analytics Institute

Selected Smart Home use cases for insurers

Mature Market Examples

Air quality

Collection of air quality data within the house, as is already done by e.g. Withings. Additional services from the insurer could include proactive health coaching, emergency intervention services (when CO_2/CO reaches dangerous levels). These services would increase interaction and ideally give insurers the opportunity to combine these services with an insurance product.

Mould detection

Data from humidity and heat sensors can be aggregated and analysed to predict mould growth inside houses. Besides the reduction in property value, mould also presents health implications, which can have strong negative long-term impacts on residents.

Insurers could offer coaching or preventive/mitigating services to remove mould from homes, when it is only a minor issue. Also, insurers could provide automatic ventilation systems for homeowners that help prevent mould from forming.

Water sensors

Water sensors could be used to detect bacteria, such as Legionella in houses, which also have major health impacts for insurers. These bacteria bring long and costly diseases with them and should therefore be tested for on a regular basis. However, sensors in the pipes could significantly improve testing accuracy and could even run water when pipes detect a risk of bacteria levels that are dangerous for humans. Insurers could use this to not only prevent the disease from breaking out, but also to increase convenience for customers.

Home and health monitoring

In elder care there are several applications that could easily combine home monitoring with health monitoring. An example could be using smart slipper technology to detect falling of older individuals (2.5m elderly people are treated for falling in US hospitals each year), to provide services or initiate contact with relatives or even to provide medical intervention on-site. These interventions can significantly reduce costs, while also improving the state-of-mind of caretakers who are unable to attend to the individual at all times.

Immature Market Examples

Anti-theft tags

GPS-location sensors could be attached to certain valuable items. In case of theft or robbery, these items could be traced more easily. This may be more relevant in immature markets as police services and follow-up in these countries may not be as proficient and exhaustive. Anti-theft tags could significantly reduce costs for new products and insurers could provide them along with services that facilitate the retrieval of such items.

Natural disaster warnings

Even though natural disasters cause as much damage in developed markets, there is a distinct opportunity to support individuals in less-developed countries with risk-mitigating services. In these countries, it is also in the public interest to mitigate the impact of earthquakes. Thus in-house interaction with individuals and improved sensoring could be used to sell disaster mitigation services to the public sector of less developed markets and open new revenue streams.

Water quality

In less-developed nations, water quality could be tested with sensors applied on a more holistic scale. Besides warning individuals who have property or health insurance with the insurer (as would be the business model for developed markets), insurers would have the opportunity to sell this updated data to municipalities, enabling the government to mitigate pandemics before they occur and to significantly reduce healthcare and intervention costs after the outbreak has started. The result would be yet another new revenue channel for insurers, albeit one that is highly dependent on scale.

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