INNOVATION CENTER

PERSPECTIVES FOR

BUILDING OPERATION

DREES & SOMMER

SUSTAINABLE, SAFE AND COST-EFFICIENT BUILDING OPERATION

The economy and society currently face huge challenges. The biggest of these are far-reaching global climate change and long-term shortage of raw materials and energy. The latter is resulting in significant increases in the cost of energy sources such as oil and gas, the use of which must end in the foreseeable future anyway. So it is clear that construction costs, and in particular the cost of building operation, will continue to rise in coming years.

According to the United Nations, the global population is expected to grow to 10.7 billion by 2050.[1] This will also impact on construction activity: In terms of floor space, we are currently building the equivalent of the whole of Paris every five days.[2] And despite this, half of the buildings that will exist globally in 2060 have not yet been built. At the same time, the construction and operation of buildings currently causes around 40 percent of global carbon emissions [3], while digitization of the planning, construction and operation phases continues apace.

What are the consequences? In the interests of users and service providers, new buildings – and established buildings in particular – will have to become Connected Buildings. As a result, the General Data Protection Regulation is gaining new significance in the real estate sector. Virtual attacks on our buildings and infrastructure will increase massively – also driven in part by Cyber War 2.0. Such attacks – disrupting or preventing the use of a company's technical systems and infrastructure – will make work in offices impossible and bring production to a standstill.

These challenges have a massive impact not only on the industry's business models and the buildings themselves but also on the job profiles and professional development of people working in the real estate sector.

All this demonstrates the central role of sustainable, safe and cost-efficient building operation. The following pages outline the key areas in which action is needed and propose possible solutions. But is important not to lose sight of the Big Picture while concentrating on the details: The necessary transformations are ultimately about preserving our values and living conditions!

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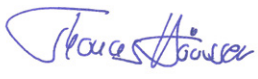

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[1] bib.bund.de, [2] dandc.eu, [3] kfw-entwicklungsbank.de

PERSPECTIVE 01

NEW BUILDING-RELATED BUSINESS MODELS AND SERVICES

The conventional office building will cease to exist in the future. One of the main reasons for this is that no one will come to the office simply to work.

PERSPECTIVE 02

CYBER SECURITY AND GDPR

In the future, many buildings will probably no longer be permitted to operate due to a lack of IT security and violations of the GDPR. Ultimately, this means that in just a few years, IT and cybersecurity experts will be essential in order to acquire an operating license.

PERSPECTIVE 03

SMART PORTFOLIO DEVELOPMENT – MANY PROPERTIES NEED UPGRADING

Current developments such as the energy crisis, scarcity of raw materials and fragile supply chains make it clear that established buildings must be ecological and economical. Most importantly, these buildings have a climate advantage, as – in contrast to new buildings – as the grey energy is already embodied.

PERSPECTIVE 04

BIG DATA VERSUS SMART DATA

Big data alone does not help us. We need smart data. This can only be achieved with systematic data analysis – enabling us to better understand building use and operation in the future.

PERSPECTIVE 05

FUTURE-ORIENTED MANAGEMENT

Many project developers, portfolio holders and investment companies invest in the wrong properties. That is very unfortunate, because anyone planning real estate today using outdated methods and technologies, and who lacks knowledge of IoT and the cloud, risks their investment.

PERSPECTIVE 06

CHANGING JOB PROFILES

The job we have today will hardly be recognizable tomorrow: Many professions are already undergoing dramatic change – and some may disappear altogether. But new ones will emerge. This change also affects the facility management profession.

PERSPECTIVE 07

ENERGY INDEPENDENCE – NEW CHALLENGES AS THE RESULT OF RISING RAW MATERIAL PRICES

Recent months have shown that renewable energies not only protect the climate but are also important for energy security and cost stability.

PERSPECTIVE 08

NETWORKED COGNITIVE BUILDINGS

The building of the future will control itself. What does this mean for users? Optimized building operation and greater amenity.

PERSPECTIVE 01

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NEW BUILDING-RELATED BUSINESS MODELS AND SERVICES

The trend towards the mobile office is redefining requirements for office buildings and residential real estate. Crucially, this means that the 'next level of work' will result in reduced office space requirements. At the same time, the quality demands made of the remaining areas will increase. They should be as technically up to date as possible and promote hybrid working and on-site collaboration.

This means that employers will have to develop new office concepts and services. And to do this, they first need a reliable data basis. Booking data combined with occupancy sensors, for example, provide information about the utilization of office and meeting space. And information can then be derived from the collected data. This enables targeted development by service providers – naturally in compliance with the General Data Protection Regulation (GDPR). A current example of this is the indoor environment – that is, temperature and air-change rate – which can be individually set and, most importantly, controlled dependent on occupancy levels.

Users benefit from innovative services

A further benefit of this approach is that it results in the creation of innovative business models and an expanded range of services for users. These include, for example, apps that show the availability of the building's parking spaces. Or whether the required e-charging infrastructure is available at a certain time, how long the queue in the canteen is, or when a suitable meeting room is available. Other possible services include the renting out of event spaces, booking of sharing services and ordering of convenient additional services, both personal and work-related. The possible functionality is virtually unlimited. And the bottom line is greater amenity for users – and many reasons to come to the office.

PERSPECTIVE 02

CYBER SECURITY AND GDPR

Ignorance and a poor choice of technical components and interfaces often result in high IT vulnerability in buildings. Frequently, insufficient attention is paid to GDPR and cybersecurity requirements, even though cyberattacks on companies and critical infrastructure are on the rise. In the worst case, planners and operators of buildings can be held liable for their ignorance. To give an example: During a cyberattack in July 2022 on the energy services provider Ista, certain functions and services were temporarily limited or completely unavailable. It is still unclear what data the attackers obtained or accessed.[1]

So what conclusions can we draw from this? Portfolio owners and investors need a comprehensive, verifiable cybersecurity and GDPR strategy for both established buildings and new buildings. In addition, large volumes of data, such as those generated in buildings, are of great interest to cybercriminals simply as 'loot'. A comprehensive protection strategy therefore also includes proof that the property and stakeholder data is stored and shows where it is stored. And exactly what data is even being collected.

Security by Design

To prevent security vulnerabilities, appropriate requirements for software and hardware must be taken into account during the planning stage (Security by Design). In future, penetration tests should be run daily to gauge the vulnerability of systems to attack.

Security by Design and GDPR must be a central focus when designing a building. And technologies that are to be networked must be tested in specialist centers for connectivity, data quality and security before installation. In future, testing must be a prerequisite for the installation of all systems in buildings.

[1] Source (in German): Hackerangriff auf deutschen Energiedienstleister Ista (faz.net)

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PERSPECTIVE 03

SMART PORTFOLIO DEVELOPMENT – MANY PROPERTIES NEED UPGRADING

Ecologically sustainable revitalization with a focus on digitization is the only way to make established buildings fit for the future. This is because digital technologies can only form the basis for new data-based services and climate protection when combined with sustainable energy generation and distribution. This saves resources. For example, about a quarter of the energy consumption in all existing buildings could be saved by hydraulic regulation of plant & equipment and its needs-based control. To do this, a building must first and foremost know how many people are in which locations in the building.

And established buildings also make a contribution to achieving the increasingly important ESG criteria. But of course, this only applies if they operate intelligently. A digital building control system automatically detects peak periods and vacancy levels in the building, thereby reducing energy consumption to a minimum.

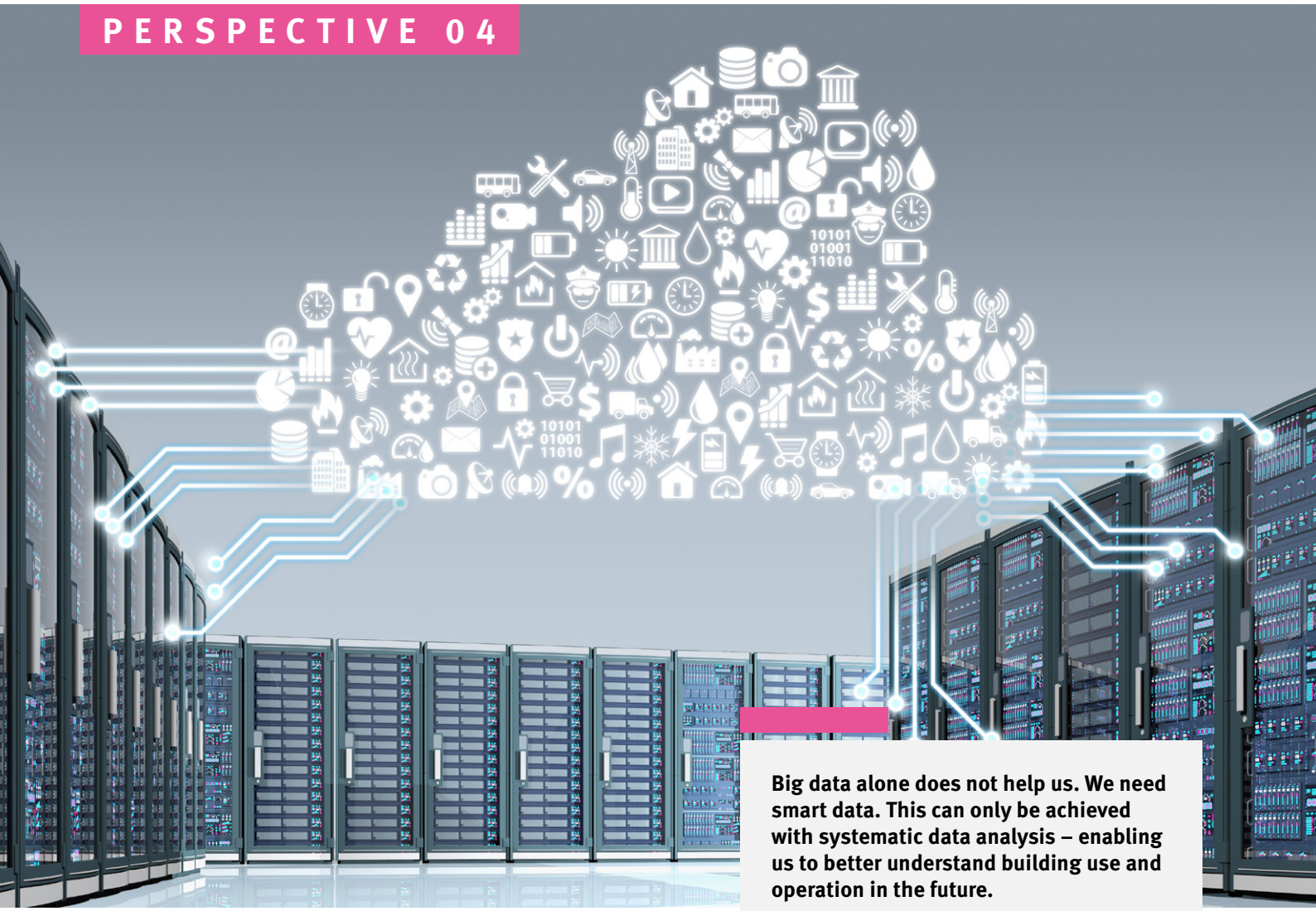
AI helps meet EU taxonomy

Artificial intelligence (AI) can already identify a building's energy-related and functional deficiencies. Effective digital data management is therefore the key to successful building management. What's more, it is often essential in order to meet disclosure requirements and reporting obligations related to sustainability goals (Green Deal/EU taxonomy, ESG regulations).

In the long term, this will also result in changes to the valuation catalog for real estate. Features such as location, type of use and resale prospects will continue to play a major role but returns will increasingly be determined by digital infrastructure, connectivity and usable data. A current example is blockchain technology, which facilitates and accelerates transparent and secure storage of all digital building data. This will revolutionize the transaction market in the foreseeable future and open the way for new business models for data provision.

Current developments such as the energy crisis, scarcity of raw materials and fragile supply chains make it clear that established buildings must be ecological and economical. Most importantly, these buildings have a climate advantage, as – in contrast to new buildings – as the grey energy is already embodied. Customized sustainability and digitization strategies are a targeted way to put established buildings on track for profitability.

PERSPECTIVE 04



Big data alone does not help us. We need smart data. This can only be achieved with systematic data analysis – enabling us to better understand building use and operation in the future.

BIG DATA VERSUS SMART DATA

Generating ever more data in keeping with the motto ‘the more the better’ has proved to be the wrong strategic approach. This is especially true for buildings and their operation: Intelligent real estate is not measured by the number of sensors installed but by the specific added value that the ‘intelligence’ provides for users and service providers. In short, quality trumps the quantity of data generated.

But how do you acquire high-quality data? Targeted ‘digitization requirements management’ is essential, especially for new buildings and real estate portfolios. While this also applies to the revitalization of established buildings, the requirements are somewhat different.

Customized Smart Buildings are the future

One thing applies to both types of property: The focus must be on requirements and ensuring added value for users and service providers. Because these are the key indicators for the desired degree of digitization – and thus for the building data required. In other words, ‘customized’.

But users and user behavior usually change over the course of building operation, so the basic structure of every building must be designed to be ‘digital ready’. The focus is on net-working all technologies installed in the property.

PERSPECTIVE 05

FUTURE-ORIENTED MANAGEMENT

Many buildings are already technologically outdated even as the first occupants move in, and no longer. reflect the digital state of the art. It follows that the initial investment must be future-oriented at the time of planning. This requires hardware solutions to be implemented as open interfaces (APIs), with a greater focus on software solutions than is the case today. Only this constellation guarantees adaptability of the building later in its lifecycle.

The construction and real estate sector also requires intelligent networking of trades and plant & equipment – so-called 'digital readiness' – both for established and new buildings. Here, too, a combination of hardware and software modules is required.

Many projects already show what is possible

When the digital transformation unfolds, we will experience a new generation of buildings. They will constantly generate new data, regulate themselves, and adapt to changes in technologies and user needs.

Projects such as the Cube Berlin by CA Immo, The Ship in Cologne by Fond Of, Digital Hammerbrooklyn in Hamburg by Art Invest, the Heidestrasse district in Berlin by Taurecon, and Drees & Sommer's OWP 12 office building in Stuttgart show what is possible. This applies not least with regard to the combination of sustainable energy concepts and digital technology.

Many project developers, portfolio owners and investment companies invest in the wrong properties. That is very unfortunate, because anyone planning real estate today using outdated methods, technologies and who lacks knowledge of IoT and the cloud, risks their investment.

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PERSPECTIVE 06

CHANGING JOB PROFILES

Software and hardware solutions in the form of IoT sensors are becoming increasingly important for building operation. These solutions are now largely cloud-based. This development increases requirements for the cost-efficient operation of buildings and makes the evaluation and analysis of the resulting data even more important. At the same time, the demands on IT expertise, data protection and cybersecurity are rising. And in this context, ongoing further training of specialist personnel is indispensable.

On the other hand, there also are significant benefits. FM operators no longer need to be controlled in the way they are today. Service requests, warranty claims, service acceptance and invoice verification are all digital and automatic. Utility cost statements are calculated daily – and all data, costs and allocation keys are available automatically. The checking and tracking of lease payments, including debt collection processes – is fully automated.

The transparency and availability of data will make real estate agents superfluous

Real estate agents will become superfluous in the foreseeable future. And there are compelling reasons for this. User requirements and the available space with relevant information about the respective building and its surroundings will be completely transparent. And they will be fully accessible via blockchain.

Prospective tenants for entire buildings, individual floors or even highly specialized areas can then search with maximum flexibility themselves and can compare and lease independently. Virtual walkthroughs and many new digital services, combined with the above-mentioned transparency, will make many of today's services and professions superfluous.

These developments will also impact on training and study courses. Schools, universities and companies will have to cooperate more closely in future if they want to prepare the next generation of people employed in the fields of building planning construction, operation and management for the upcoming challenges.

The job we have today will hardly be recognizable tomorrow: Many professions are already undergoing dramatic change – and some may disappear altogether. But new ones will emerge. This change also affects the facility management profession.

The events of recent months have shown that renewable energies not only protect the climate, but are also important for energy security and cost stability.

PERSPECTIVE 07

ENERGY INDEPENDENCE – NEW CHALLENGES AS THE RESULT OF RISING RAW MATERIAL PRICES

As energy costs continue to rise, property owners face a completely new situation: The current sharp rises in utility costs mean that we must prevent them reaching a level similar to the basic rent. And the task of finding ways to reduce energy consumption and alternatives to heating based on fossil oil and gas is becoming increasingly urgent.

Digitally optimizing user behavior

In addition to alternative technologies, one approach is to improve user behavior. Here, networked systems technology and artificial intelligence (AI) are decisive factors, as they can often significantly increase the efficiency of systems. The effect for the building owners is a measurable reduction in energy consumption.

But there is still a downside, because networked systems increase the vulnerability of digital building systems.

To achieve energy independence, all players must now take concerted action to ensure they are no longer dependent on fossil energy and that their systems and digital infrastructure are not vulnerable to attack. In the future, few projects will be realized that have no sustainable, post-fossil energy concept and an associated digitization strategy.

PERSPECTIVE 08

NETWORKED COGNITIVE BUILDINGS

The building of the future is multilingual: Thanks to digital data standards, it can work with hardware from any manufacturer. It translates signals from systems and components into valuable information and messages. All this flows into a higher-level dashboard or into the building's digital 'brain'.

This intelligent networking of a building or a district will develop into a thinking building complex, a network of so-called cognitive buildings. For users, this results in even greater amenity and optimized operation. For example, a Cognitive Building recognizes the intensity of use, age and condition of its plant & equipment and automatically develops a maintenance and repair plan. All information is stored, tracked and followed up in the building's brain. This also guarantees an immediate response to sudden failures and signs of wear and tear.

A focus on wellbeing

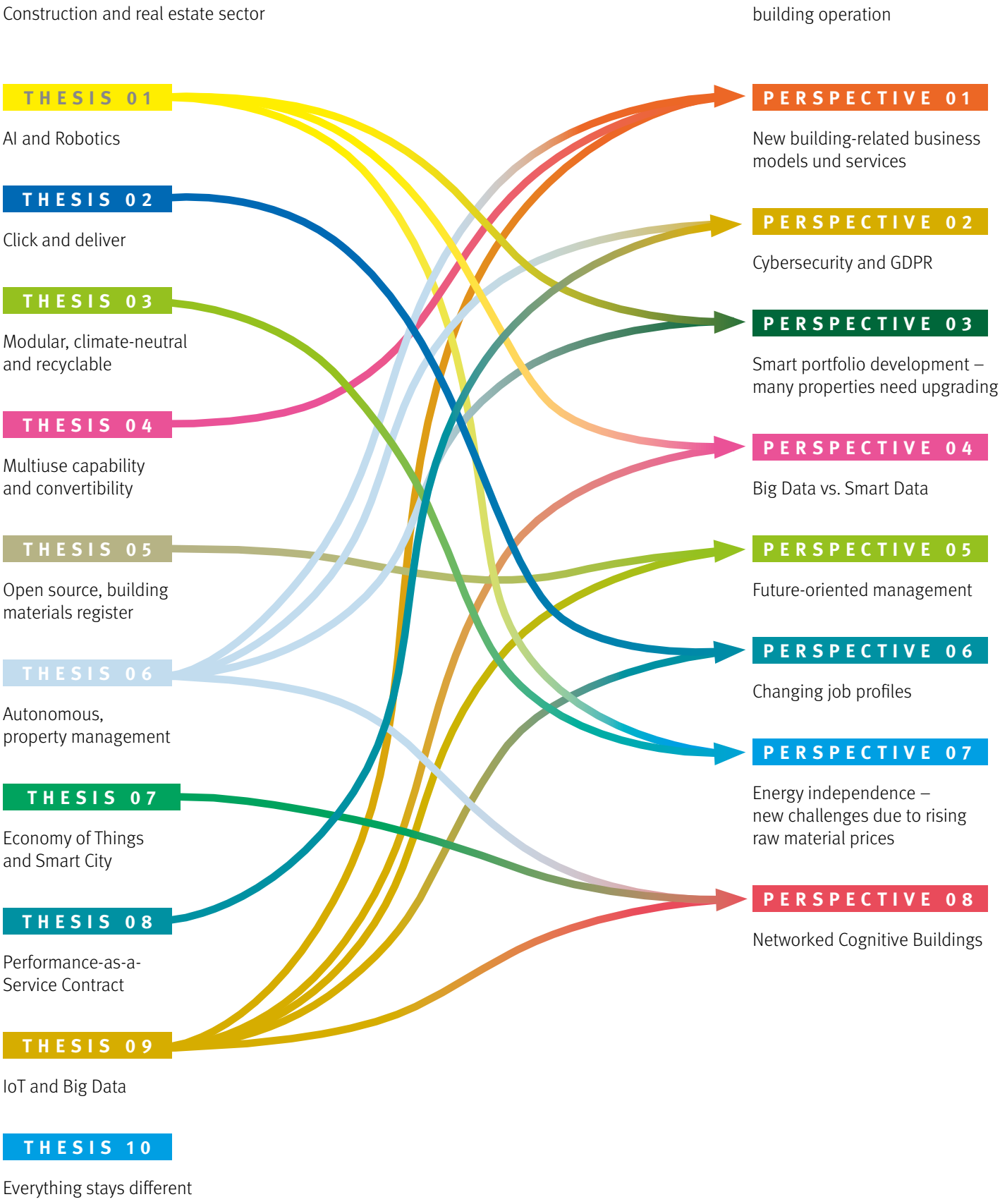
There are also sensors that continuously measure air quality and temperature, humidity and CO_2 content, and that can also detect pathogens. Future building use will have a focus on health and wellbeing. This also means that workplaces in an office building will provide information about design and wellbeing at the workplace.

Positive impact on the built environment

In addition to the above-mentioned networking of all devices and sensors, the basis for the 'behavior' of a Cognitive Building is the AI-assisted evaluation and interpretation of the collected data (smart data). Interaction with surrounding buildings and entire city districts also allows conclusions to be drawn about the utilization of public transport, or restaurant and shop revenues based on workplace and meeting rooms occupancy in individual buildings. And the intelligent networking of all buildings with a sustainable mobility concept and the networking of the surrounding infrastructure will also make the city of the future a smart city in terms of transport.

The building of the future will control itself. What does this mean for users? Optimized building operation and greater amenity.

The relationship between the construction and real estate sector and building operation



WHAT PERSPECTIVES DO YOU SEE FOR THE INFRASTRUCTURE SECTOR?

Innovation cannot be achieved unilaterally – we need exchange and cooperation in order to find answers to the big questions of the future. Would you like to exchange ideas with us about future challenges and strategies for digital building operation? If so, please get in touch: digital.operation@dreso.com

Our future theses look forward to the year 2030 for the construction and real estate industry – and find concrete expression in 'Perspectives for Building Operation'. You can find out more about our Future Theses 2030 here.

We publish content on future perspectives and innovations at irregular intervals. If you are interested, we will be happy to add you to our mailing list: dreso.com/innovation-update

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